how to build 20 BOATS

Edited by **Boris Leonardi,**
Publisher, The Rudder Magazine

A FAWCETT
75c
HOW-TO BOOK
362

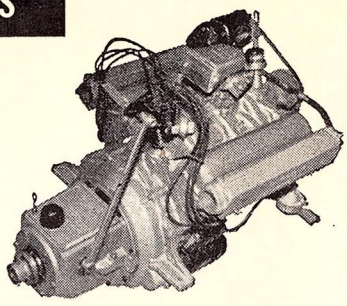
TRITON—19 ft. 6 in. sloop

SWELL TIME—14 ft. runabout

- OUTBOARD RUNABOUTS, CRUISERS, DUCKBOAT
- SLOOPS, KETCH, CATAMARAN
- INBOARD CRUISER, LAUNCH
- PRAMS, ROWBOATS, KAYAK

THE THING—11 ft. novelty outboard

BARR MARINE CONVERSIONS



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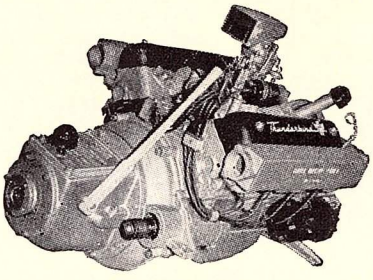
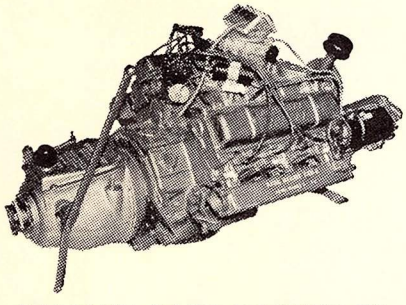
- Economy of operation
- Latest research of automotive industry
- Nationwide parts and service



THUNDERBIRD V8



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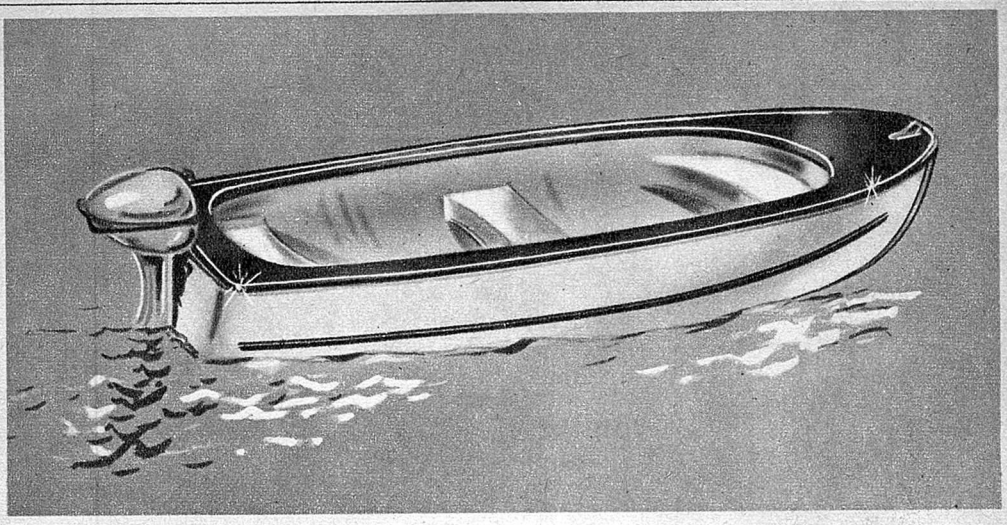


Now YOU CAN BUILD YOUR OWN FIBERGLASS BOAT

Here Is a New Idea That Is REALLY New!

A truly revolutionary new method of boat molding with fiberglass-reinforced Castoglas opens up tremendous new possibilities. The BIG IDEA is the inexpensive, disposable mold in which the resin-impregnated fiberglass is formed. Now, for the first time, the Castolite Molding Method is being made available to everybody. Experienced boat builders say it's downright uncanny when you watch the process and see the hull take shape in a matter of just a few hours.

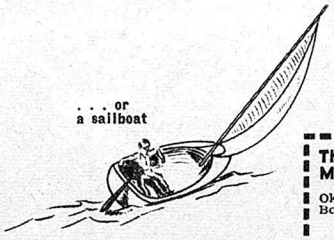
It's a rowboat or a dinghy

How One-Piece, Seamless Hull Is Made

You assemble the composition board mold in less than one hour. Then you coat the mold with Castoglas resin and apply three layers of fiberglass fabric. These are impregnated with more Castoglas . . . just brush it on. It hardens within 30 to 60 minutes. For maximum toughness, let it set overnight. Next morning, strip off the mold which you can either throw away or use over again. There's your hull. It's all handwork, done with hand tools.

One Basic Hull for Several Designs and Styles

You can make the hull in several sizes and use the same shell for boats of different designs. If you want to keep it very simple, make three wooden seats and suspend them from the gunwale. You now have a seaworthy rowboat, dinghy or lifeboat. A centerboard well and simple mast step convert her into a sporty sailing craft. No matter how she is used, for rowing, fishing, sailing or outboard motoring, she handles easily and safely. As the illustration shows, you need not stop with three plywood seats if you prefer a more elaborate treatment. We supply drawings for various styles.



. . . or a sailboat

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Here are just a few: light weight, high strength makes them the perfect cartop or portage boat. Maintenance free, color is built in. Will not rot, rust, corrode. Cannot leak. Won't absorb water and therefore will not gain weight through the season. Ready to go the minute you are ready to use them. You can build them yourself economically and save more than half the cost.

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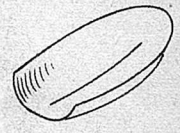
Yes. We are building a limited number for the man who wants to build his own fiberglass boat but does not want to start from the bottom up. It costs more, of course, and the freight charges are higher. But . . . buying this completed hull has advantages you ought to know about. Well, here we are at the end of the page! Why don't you write to us and let me tell you more about this whole deal? Just print your name and address on the coupon and mail it to me in care of the Company.



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Marine Division, Dept. M-20

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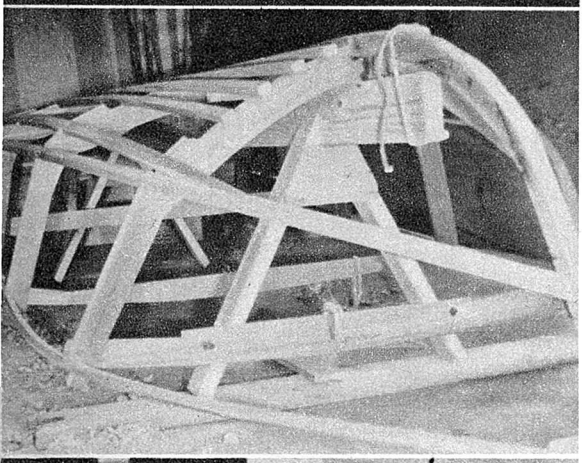
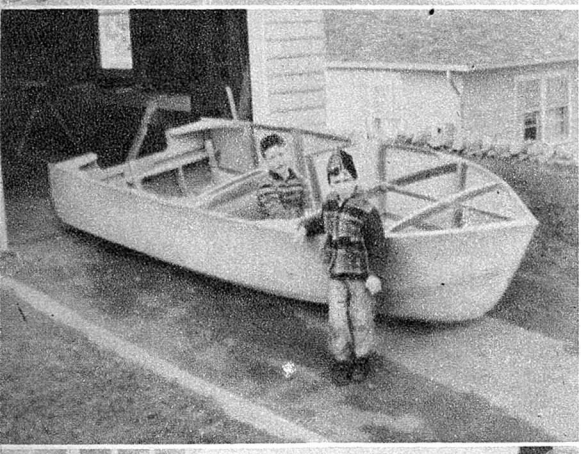
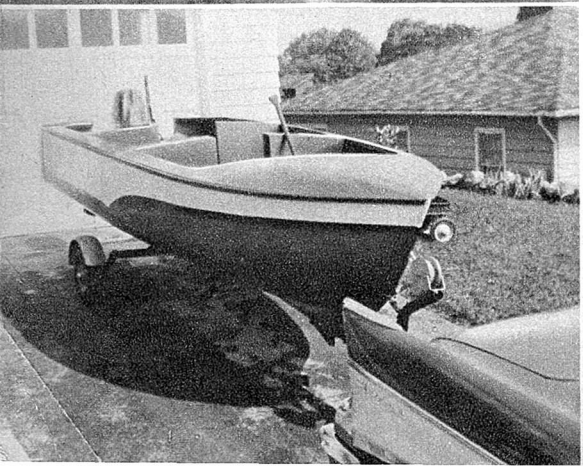
It's FREE

HOW TO BUILD 20 BOATS

By the Editors of The Rudder Magazine







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SMITHCRAFT "SKI-LARK," trim and jaunty sport boat, combines rugged Weldwood Duraply hull bottom with beautiful Weldwood Samara for sides, decks, and transoms. By using Weldwood Waterproof Plywoods, Smithcraft can offer you this quality boat at a moderate price. The big Weldwood panels cover large areas easily, need less caulking, and like all Weldwood Marine Plywoods, are guaranteed not to delaminate.

Whether you buy a finished boat or a kit, the quality of the materials that go into it are of first importance. That's why leading boat manufacturers specify Weldwood Waterproof Plywoods. Look for the Weldwood tag when you buy your boat. It's your assurance of finest materials and maximum value for your boat dollar.

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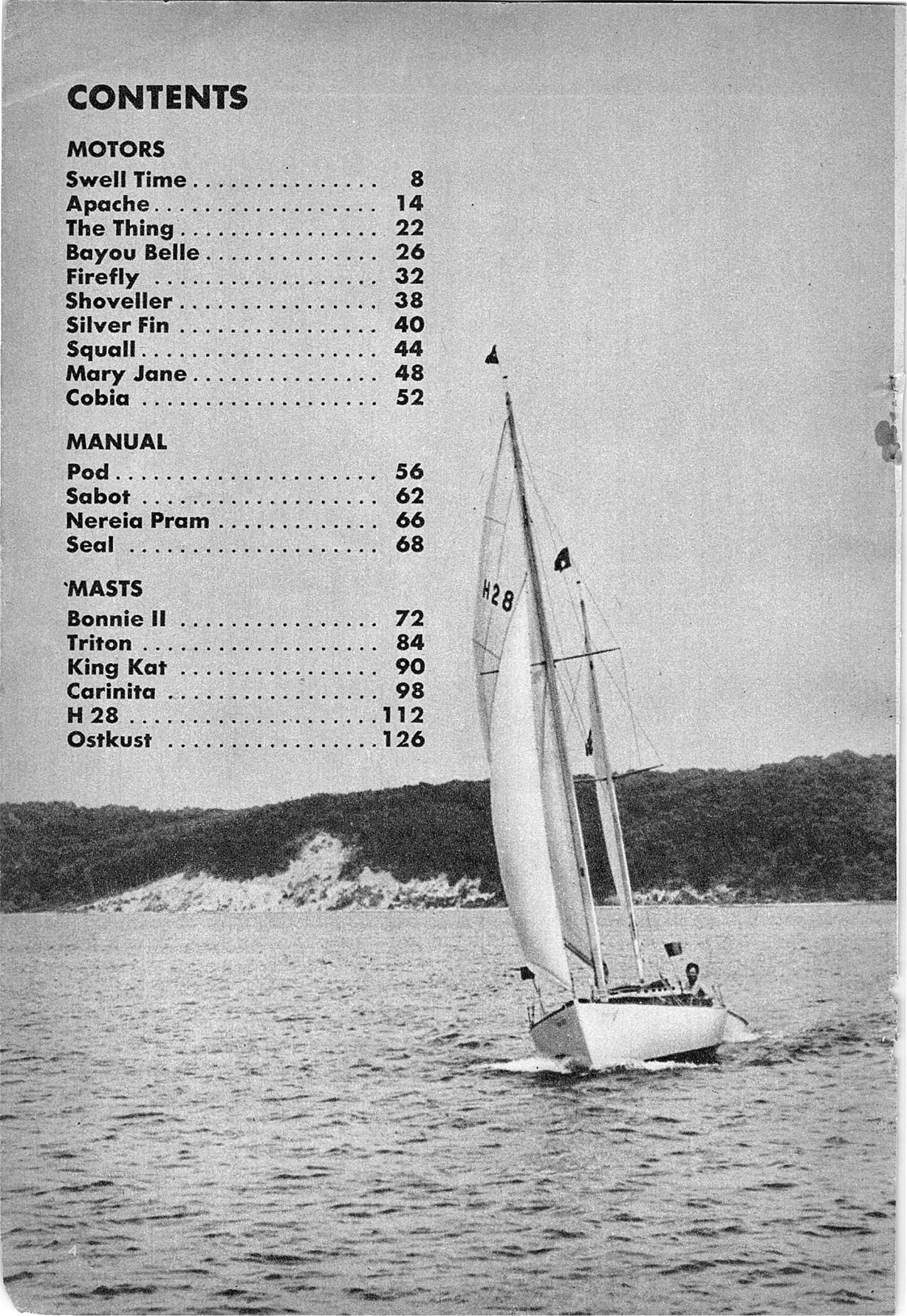

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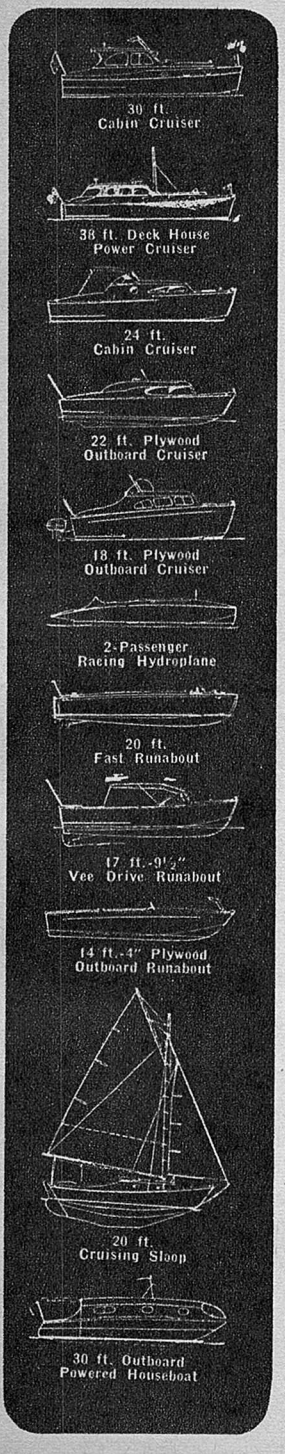
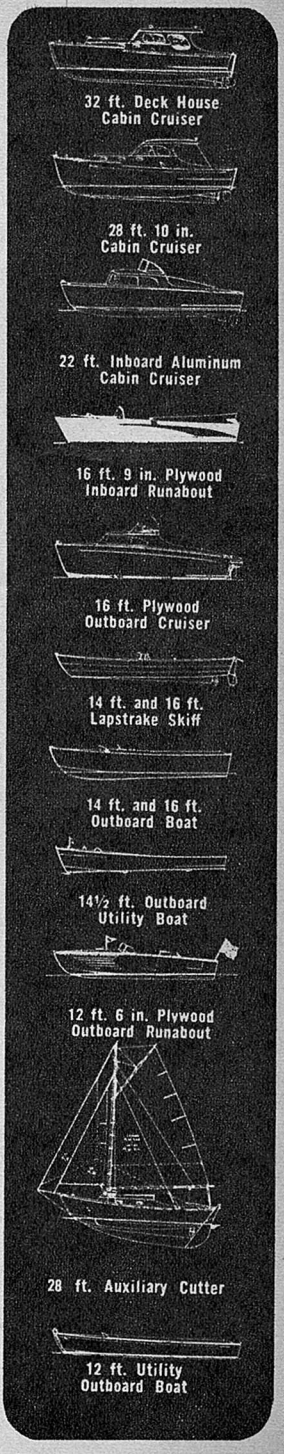




INTRODUCTION

To get a good boat, one must start with a good design. The collection in this book has been carefully made to give the amateur builder a head start by supplying him with plans prepared by national experts who have been commissioned to supply detailed drawings for amateur builders.

This means that nothing has been left to the imagination. A man equipped with basic woodworking tools, some experience and patience should be able to get his dream boat translated into a real life of excitement and action.

The choice of boats offered in this book is wide—from the narrow-bottomed rowboat, through speedy outboards and on to a cruising auxiliary which will take you on a leisurely cruise to the West Indies if you have time.

Boats don't go out of fashion. After a few years, if your taste or requirements should change, you can always sell your boat and start a new one.

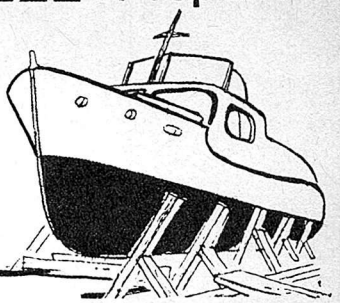
The building of your own boat is a challenge, but if you meet it, the reward is the deep satisfaction of a self-made life afloat.

Boris Lauer-Leonardi

Editor of The Rudder Magazine

f'ward and aft_____above or below_____
for original construction_____or repairs.

GIVE YOUR BOAT a LONGER LIFE with KUHLS ELASTIC®



SEAM COMPOSITIONS
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MOST WIDELY USED *Elastic* MARINE PRODUCTS FOR KEEPING ALL TYPES OF CRAFTS WATERTIGHT AND TRIM

KUHLS 18 GREAT MARINE PRODUCTS

Be certain—use this list for ready reference

MAKE SURE ITS KUHLS

ELASTIC SEAM COMPOSITION No. 1—For deck seams

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SEAMLAST—A mastic type seam filler for hulls

SEALTITE—A Liquid Rubber sealer

CANVAS CEMENT—For cementing or repairing canvas decks, etc.

"AVIO"—Aer-O-Nautic liquid marine glue

TROWELAST—For surfacing dents, etc., on iron, wood, steel, etc.

BRUSHLAST—For surfacing cracked canvas—for hard racing bottom finishes, etc.

BEDLAST—For bedding, mouldings, deck hardware, etc.

CANVAS PRESERVATIVES—For waterproofing and preserving canvas covers, etc.

FIREGARD—Fire resisting canvas preservative

SEAM PAINT—A primer for deck and hull seams

LINOLAST—A waterproof linoleum cement

DOUBLE PLANK CEMENT—For double plank boat construction

PATCHLAST—A Waterproof, elastic adhesive for patching canvas covers

3 WAY PRESERVATIVE—For Wood, Canvas and Rope (Clear Color)

WOODTEX—(Wood plastic) for filling countersunk screw holes, dents, gouges, etc. Colors: Natural, Mahogany, Light Mahogany, Cedar, Pine, Fir, Oak, Light Oak and Teak.

WOODTEX—(Surfacer) For filling and glazing over slight surface imperfections. Quick drying colors: Natural, White, Mahogany, Cedar, Pine, Fir, Oak, Light Oak and Teak.

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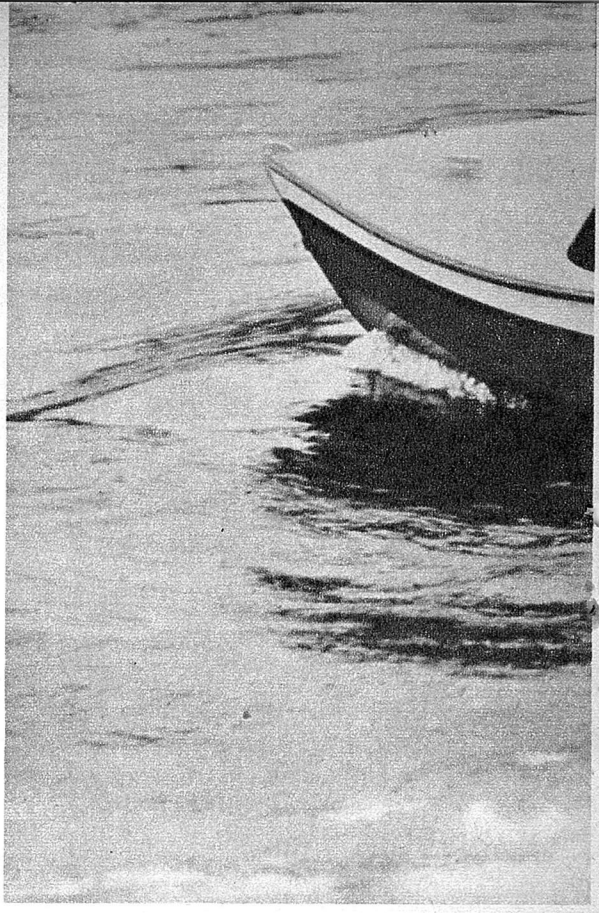
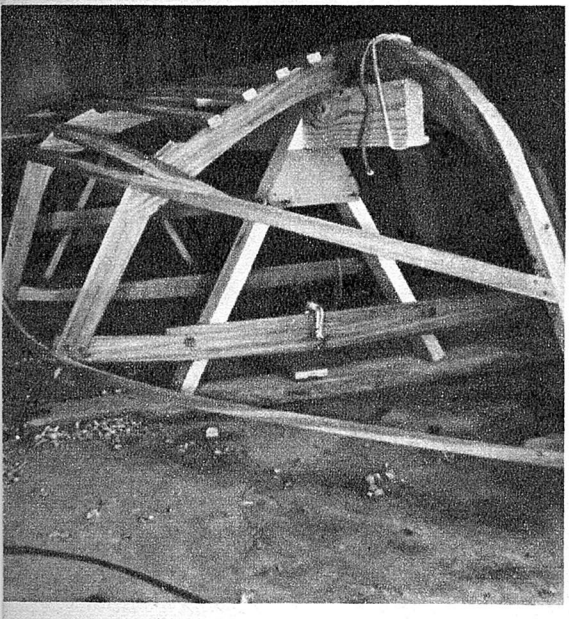
SWELL TIME

by Bill Futrell

Here's our cover boat. It's a speedy but safe 13-foot family runabout that both mom and the kids will love, and dad will want to build.



Designer-builder Futrell and son demonstrate the



The keel, battens, chine and sheer are now in place. Before beginning the plywood planking, the whole rig must be faired very carefully.

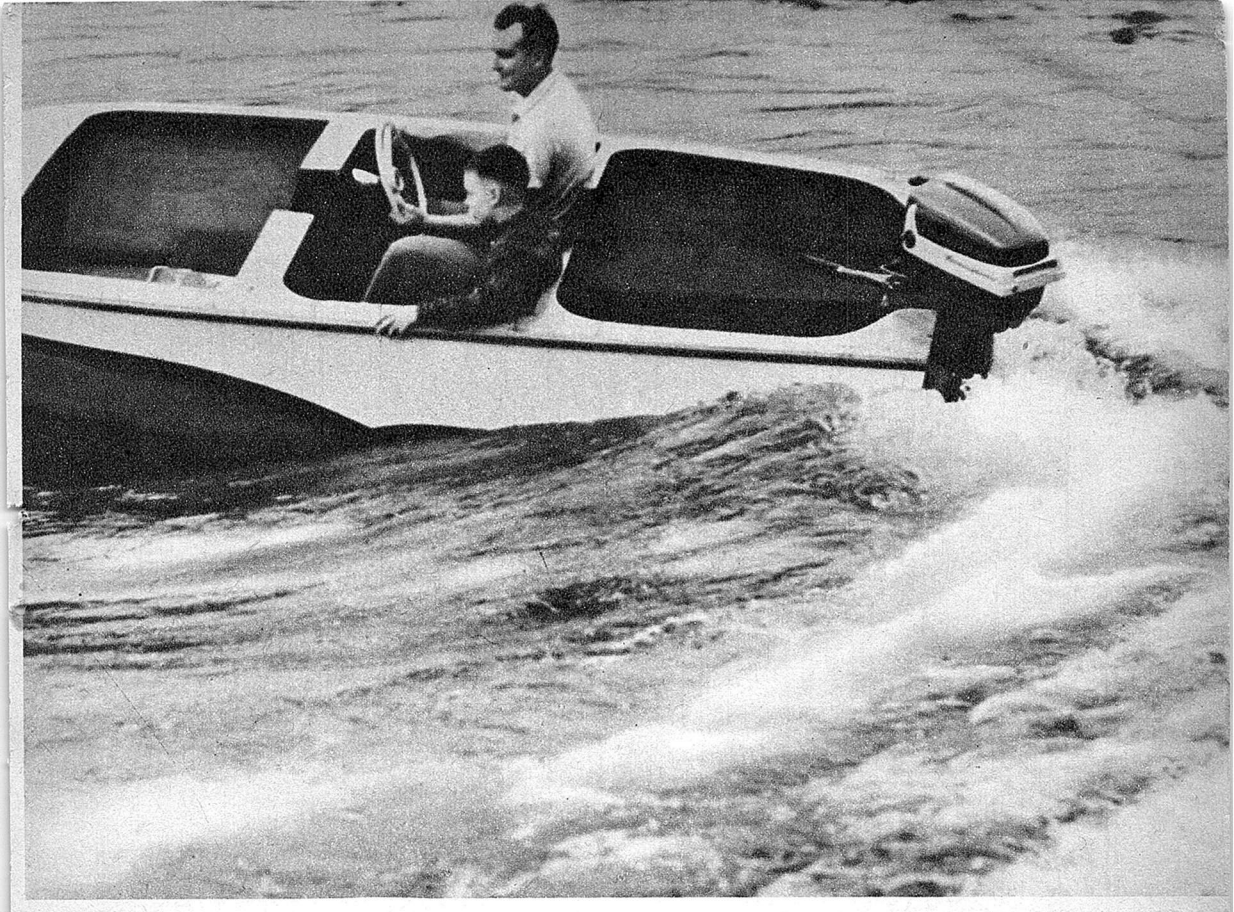
SWELL TIME was designed as a family runabout. With safety in mind, she was made 32 inches deep and 68 inches wide. The bottom is 60 inches wide to make her fast and capable of carrying a heavy load.

One of the features of this boat is tapered chines to make her highly maneuverable and safe in a high-speed turn. The bottom design makes her a smooth riding boat in rough water. All the frames are covered by the seats and back rests. The back seats lift up to provide storage space.

The boat is sturdily designed. With a 30 h.p. motor, she is a live bombshell; she planes easily with a small motor.

The first step in building Swell Time, after selecting the materials, is to make full-size frame patterns. The frames are molded three inches thick, and are cut from one-inch stock. The bottoms of all frames are cut with a 15° bevel to lay at the same angle with the transom. All of the side frames are cut straight and are faired after the framing is assembled.

All frames are assembled with three 1½-



high degree of safe maneuverability you can expect from Swell Time as Bill puts the boat into a tight turn.

inch No. 8 brass screws and glued with a good waterproof glue at each joint. No. 4 frame is cut for the seat riser but completely assembled over the full-size pattern. Attach a brace across the top of this frame to hold it together. After the hull is completed, this brace can be removed.

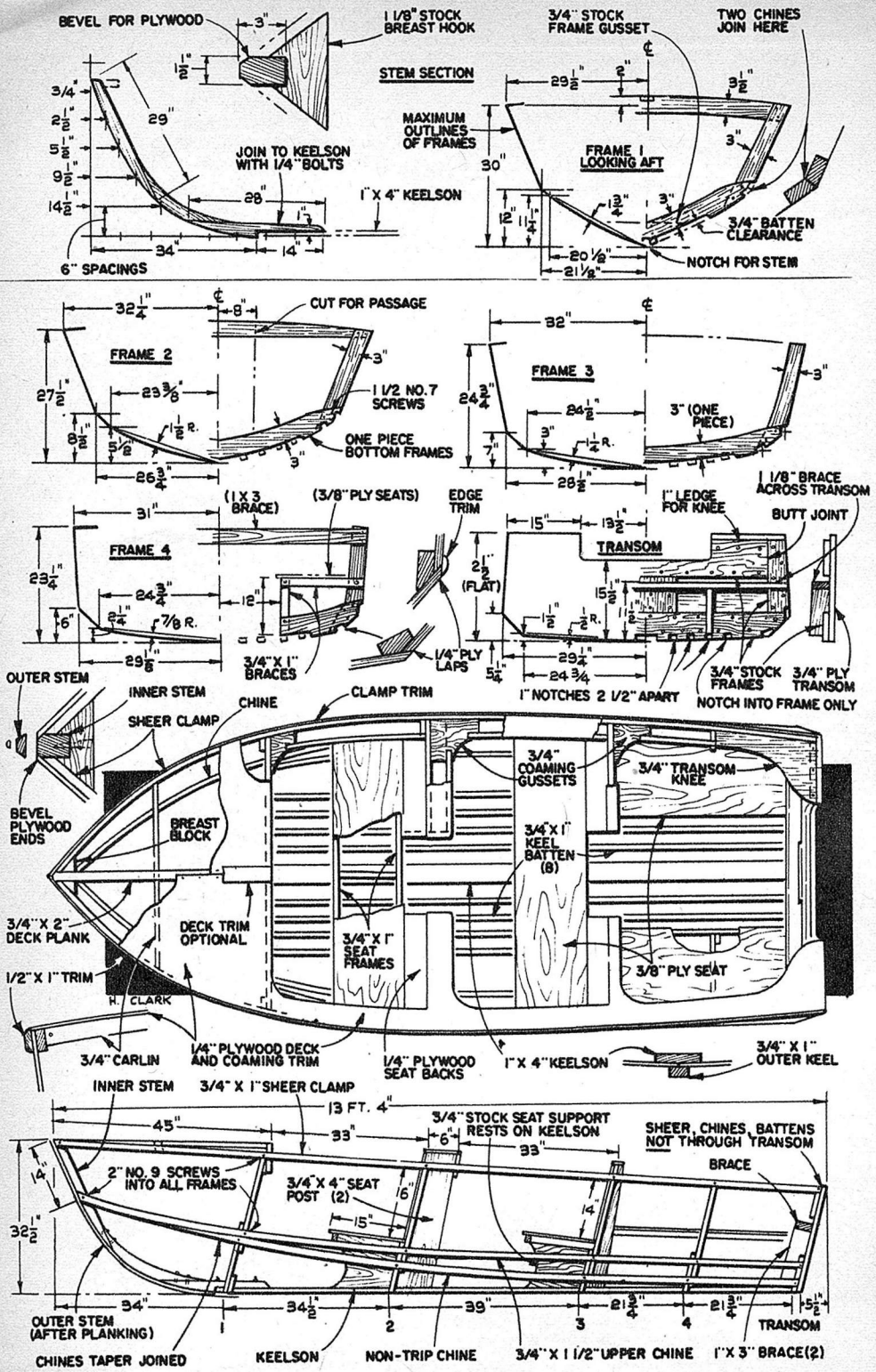
Care must be taken when assembling the transom, as the frame serves as part of the seat riser. The bottom frame on the transom is notched to accept the keel and battens. Use 1¼ No. 8 screws to assemble the transom. The transom bar is installed with two-inch No. 10 screws. All parts are glued.

The stem is next in line. This is cut from two-inch stock and braced on each side with one-inch stock. Be careful to cut the notch for the keel square. The keel is attached to the stem with three two-inch No. 10 screws.

Now make the building form and start setting up the frames. The building form can be made from a straight 2x10 with trestle-type legs. Cut the notches for the frames at 15 and set the frames in place on the form. Legs can be clamped to the transom to hold it in position while the keel is being attached. Use batten compound between the keel and transom. Be sure the transom is level and square with the keel and tack a diagonal brace between transom and keel to hold it in line while the rest of the framing is in progress. Fasten with two 1½-inch No. 10 screws at each frame.

After the keel is attached to the frames, secure the keel to the building form. Now attach all the battens in the same manner as the keel, making sure the frames remain square to the keel.

Next, install the main chines. These should be selected carefully and may require some soaking. This can be done by wrapping the chines in cloths and pouring boiling water over them. I attached the chines to the stem with two 1¼-inch No. 8 screws; then, put a rope around the chine and No. 3 frame. Take up slowly on the rope and repeat the soaking as necessary. When the chines are drawn in place, secure all frames and transom with one 1½-inch No.


BEVEL FOR PLYWOOD
1 1/8" STOCK BREAST HOOK
STEM SECTION
JOIN TO KEELSON WITH 1/4" BOLTS
1" X 4" KEELSON
6" SPACINGS
3/4" STOCK FRAME GUSSET
TWO CHINES JOIN HERE
MAXIMUM OUTLINES OF FRAMES
FRAME 1 LOOKING AFT
3/4" BATTEN CLEARANCE
NOTCH FOR STEM
FRAME 2
CUT FOR PASSAGE
1 1/2 NO. 7 SCREWS
ONE PIECE BOTTOM FRAMES
FRAME 3
3" (ONE PIECE)
1 1/8" BRACE ACROSS TRANSOM
BUTT JOINT
FRAME 4
(1 X 3 BRACE)
(3/8" PLY SEATS)
EDGE TRIM
1" LEDGE FOR KNEE
TRANSOM
3/4" X 1" BRACES
1/4" PLY LAPS
1" NOTCHES 2 1/2" APART
3/4" STOCK FRAMES
3/4" PLY TRANSOM
NOTCH INTO FRAME ONLY
OUTER STEM
INNER STEM
SHEER CLAMP
CHINE
CLAMP TRIM
BEVEL PLYWOOD ENDS
BREAST BLOCK
3/4" COAMING GUSSETS
3/4" TRANSOM KNEE
3/4" X 1" KEEL BATTEN (8)
3/4" X 2" DECK PLANK
DECK TRIM OPTIONAL
1/2" X 1" TRIM
3/4" X 1" SEAT FRAMES
3/8" PLY SEAT
H. CLARK
3/4" CARLIN
1/4" PLYWOOD DECK AND COAMING TRIM
1/4" PLYWOOD SEAT BACKS
1" X 4" KEELSON
3/4" X 1" OUTER KEEL
INNER STEM
3/4" X 1" SHEER CLAMP
13 FT. 4"
45"
33"
3/4" STOCK SEAT SUPPORT RESTS ON KEELSON
SHEER, CHINES, BATTENS NOT THROUGH TRANSOM
BRACE
2" NO. 9 SCREWS INTO ALL FRAMES
3/4" X 4" SEAT POST (2)
OUTER STEM (AFTER PLANKING)
CHINES TAPER JOINED
KEELSON
NON-TRIP CHINE
3/4" X 1 1/2" UPPER CHINE
1" X 3" BRACE (2)
TRANSOM

8 screw. Use batten compound at transom.

The secondary chines are next in order. Start with a piece of wood long enough to allow for trimming. Cut the angle to fit the main chine just ahead of frame No. 1. Attach to the main chine with three screws in progressive sizes 1 inch, 1¼ inch, 1½ inch No. 8. This chine will require some soaking. Pull down and attach to all frames and transom with one 1½-inch No. 8 screw.

Install the sheer clamps at the stem. Then attach the deck frame. This frame serves as a spreader to give a nice rounded curve to the deck and side panels. All fastenings are 1¼-inch No. 8 screws.

Cut and install the breasthook; this is cut from 2-inch stock and beveled to fit snug against the sheer clamps and stem. Fasten to stem with one 2-inch No. 10 screw, to the clamps with four 1¼-inch No. 8 screws.

Cut and install the transom knees. These are cut from 1-inch stock and will extend from transom to No. 4 frame. Attach through the knee to the transom frame with six 2-inch No. 10 screws; to the frame No. 4 with one 2-inch No. 10. This knee is notched and the sheer clamp overlaps it 4 inches. Fasten here with one 1¼-inch No. 8 screw.

Now the framing is completed and must be faired very carefully. Grind all the nicks out of your plane, get a good flexible straightedge and go to work. This part of the job means a great deal in the final appearance of your boat and how watertight she will be. It is easier to countersink screwheads than to resharpen the plane.

The side panels are to be cut from ¼-inch marine plywood sheets 14 feet long. This length is slightly higher but makes a much nicer appearing job. To get all the covering two sheets of plywood, one side panel must be cut from each sheet. Patterns can easily be made from wrapping paper. Before installing, bevel the bottom side so the chines and side will butt together flush. Attach with batten compound on transom, chines, stem and outer keel. Use ⅞-inch No. 8 screws, three inches on center.

The bottoms are put on next. Use the remaining straight edge against the outer keel. Cut to size, being sure to save the narrow strip to use on the chines. The bottom butts flush against the sides from the secondary chines forward. Do this fitting before using the batten compound. It can be held in place with C clamps on the chine and keel. Plane it carefully and pull in place with ⅞-inch No. 8 screws, two inches on center as you work forward. After the fitting is done, remove the clamp but not the screws in the bow. Apply batten compound on all parts and attach with a dozen

BILL OF MATERIALS

MAHOGANY

Transom: 2 pieces 1 in. x 12 in. x 5 ft.
Transom frame: 1 piece 1 in. x 6 in. x 14 ft.
No. 2, 3, 4 side frames: 1 piece 1 in. x 6 in. x 10 ft.
No. 1 bottom frame: 2 pieces 1 in. x 6 in. x 2 ft.
No. 2 bottom frame: 1 piece 1 in. x 12 in. x 5 ft.
No. 3 bottom frame: 1 piece 1 in. x 8 in. x 5 ft.
No. 4 bottom frame: 2 pieces 1 in. x 8 in. x 2 ft.
Keel: 1 piece 1 in. x 4 in. x 13 ft.
Stem: 1 piece 2 in. x 8 in. x 3 ft.
Battens: 8 pieces 1 in. x 1¼ in. x 12 ft.
Chines: 4 pieces 1 in. x 1½ in. x 14 ft.
Coaming clamps: 4 pieces ¾ in. x 1 in. x 14 ft.
Outer keel: 1 piece 1 in. x 2 in. x 13 ft.
Spray rails: 2 pieces 1 in. x 2 in. x 6 ft.
Deck frame: 1 piece 1 in. x 6 in. x 5½ ft.
Deck frame: 1 piece 1 in. x 4 in. x 3 ft.
Deck beam: 1 piece 1 in. x 2 in. x 4 ft.
Transom knees: 2 pieces 1 in. x 12 in. x 2½ ft.
Seat framing: 1 in. x 2 in. x 46 LF
Backrest framing: 2 pieces 1 in. x 6 in. x 12 ft.

FASTENINGS

10 gross ⅞ in. No. 8 flathead brass screws
4 gross 1¼ in. No. 8 flathead brass screws
1 gross 1½ in. No. 8 flathead brass screws
1 gross ¾ in. No. 4 flathead brass screws
4 dozen 1 in. No. 8 flathead brass screws
4 dozen 2 in. No. 10 flathead brass screws

PAINT PRODUCTS

1 pt. Casco-Fin glue
1 lb. Wildwood glue
1 lb. wood dough
1 qt. batten compound
4 qts. marine sealer
2 qts. hull enamel
2 qts. bottom enamel
4 qts. Spar varnish

PLYWOOD

2 sheets ¼ in. x 4 ft. x 14 ft. fir (marine grade)
1 sheet ¼ in. x 4 ft. x 8 ft. fir (marine grade)
1 sheet ⅜ in. x 4 ft. x 8 in. fir (marine grade)
1 sheet ¼ in. x 4 ft. x 8 in. mahogany (marine grade)

⅞-inch No. 8 locating screws. Now attach all the way around with ⅞-inch No. 8 screws, three inches on center and six inches on center on all battens.

Hunt up the two narrow strips of plywoods that were left over; they are your chines. They should be about an inch too wide. Tack them in place, overlapping the sides and bottom, and use a sharp pencil to mark. Saw to size, leaving just enough to fit by planing. Set in batten compound and fasten with ⅞-inch No. 8 screws, three inches apart.

Install the outer stem with 1¼-inch No. 8 screws and you have the hull completed, ready for sanding and painting.

Turn the hull over and set it on formed trestles to start the inside and deck work. Remove the building jig.

The ¼-inch plywood seat riser is measured and cut to fit and to extend under the second seat. Attach to the inside of the third batten from the keel with 1-inch No. 8 screws. Also attach to the transom knee.

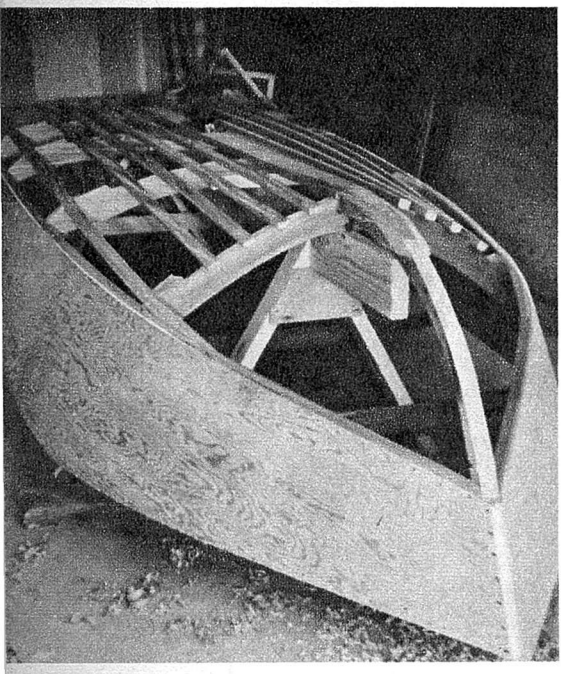
Install a 1x2-inch horizontal brace across No. 2 and No. 3 frames 9¾ inches above the keel. These braces are flush with the side frame and are attached with one 1¼-inch No. 8 screw at each end.

Measure the backs for the two front seats and cut from ¼-inch plywood. These are cut with a 12-ft. radius on the top edge and installed to the back of the frames and to the seat frame.

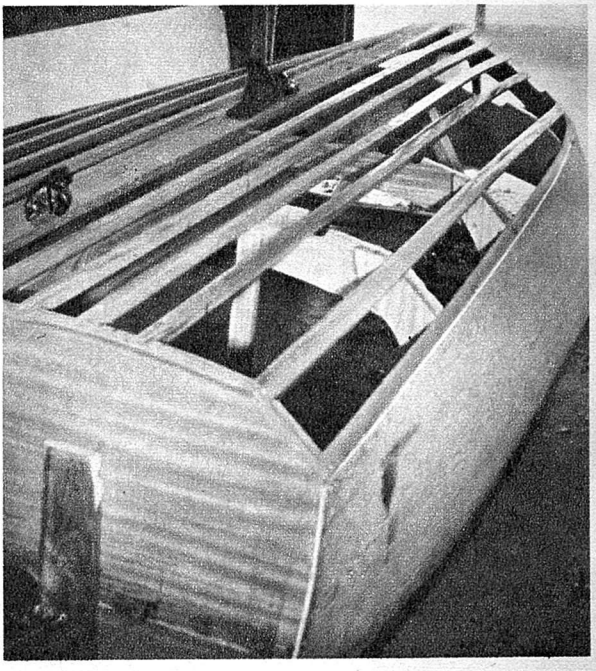
Now cut eight 1x2x13-inch seat frames. The outside frames are installed first with 1-inch No. 8 screws through the hull into the frame. The back edge is level with the back seat frames, the front edge is 11½ inches above the keel. Install a 1x2-inch frame across the front of the seat framing; attach the other four 13-inch pieces over the third batten so a ¼-inch plywood brace can be installed between this batten and the seat frame. To do this, clamp a straightedge across the plywood backs and attach the uprights with 1¼-inch No. 8 screws. The brace from this frame to boat side is now cut and installed.

If you plan to mount the wheel where

Before installing the side panels, bevel the bottom to make the chines and side butt flush together. Attach panels with batten compound.



The keel, battens and chine fit through the transom frame, not through the transom. Care during construction will result in a watertight hull.



I did, cut this dash panel about 6 inches wide and secure with three 1½-inch No. 8 screws. Install a spacer at the side of the boat with which to attach the outer edge. This spacer is cut for both the dashboard and the inside coaming clamp. Now install the coaming clamps. These are ¾x1 inch and attached in two sections from the front deck to the first backrest. Notch the second backrest and install the final piece from the front backrest to the transom knee. These are secured with 1¼-inch No. 8 screws.

Now install the framing for the back seats. Fit in a 1x1¼-inch frame along the top of the plywood riser, flush with the transom bar. There is a brace required across the fourth frame to the seat riser. This is a 1x1¼-inch piece and installed with two 1¼-inch No. 8 screws. The seats are cut from ⅜-inch exterior plywood and fastened with 1-inch No. 8 screws 6 inches apart.

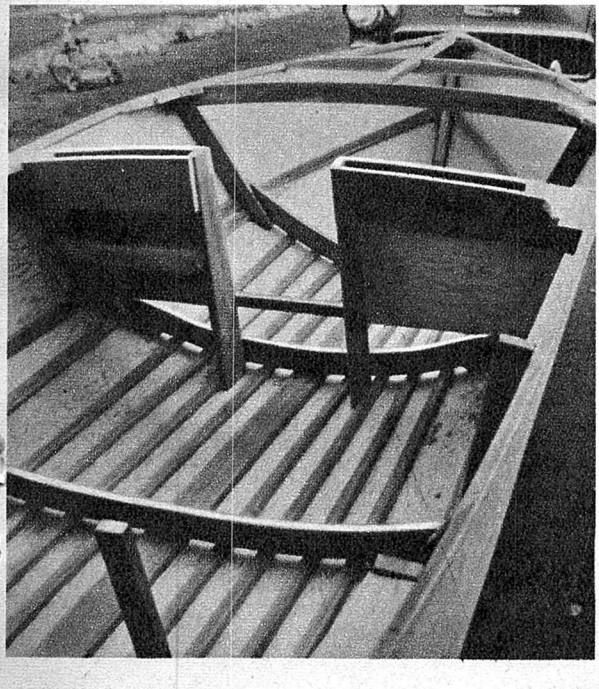
Notch the two deck frames and install the deck beam. The covering is ¼-inch mahogany marine plywood. You can get all of the deck from one 4x8-foot sheet. Allow a small overhang for trimming and fasten with waterproof glue and ¾-inch No. 4 screws on center.

The outside coaming is fastened with 1¼-inch No. 8 screws starting at the bow and 6 inches on center. This may require soaking. Fill all the screw holes, sand completely and make ready for painting.

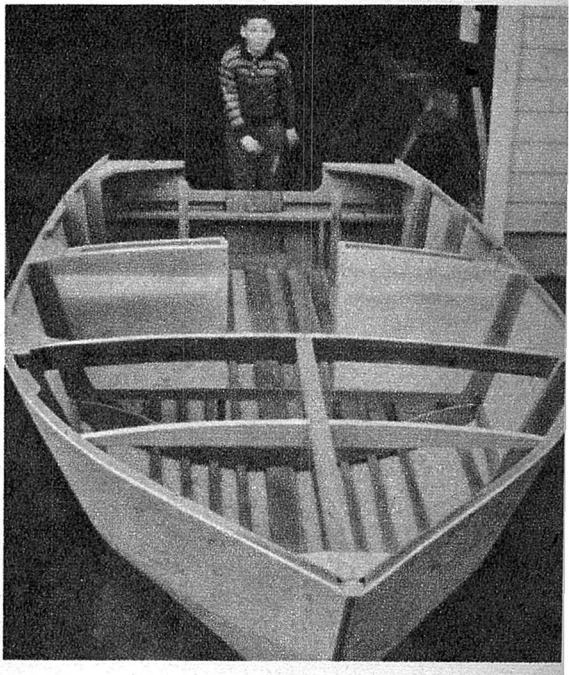
The mahogany parts to be varnished should be stained first and the entire boat given a coat of clear marine sealer. All painted parts should have three coats of paint, sanded lightly between coats.

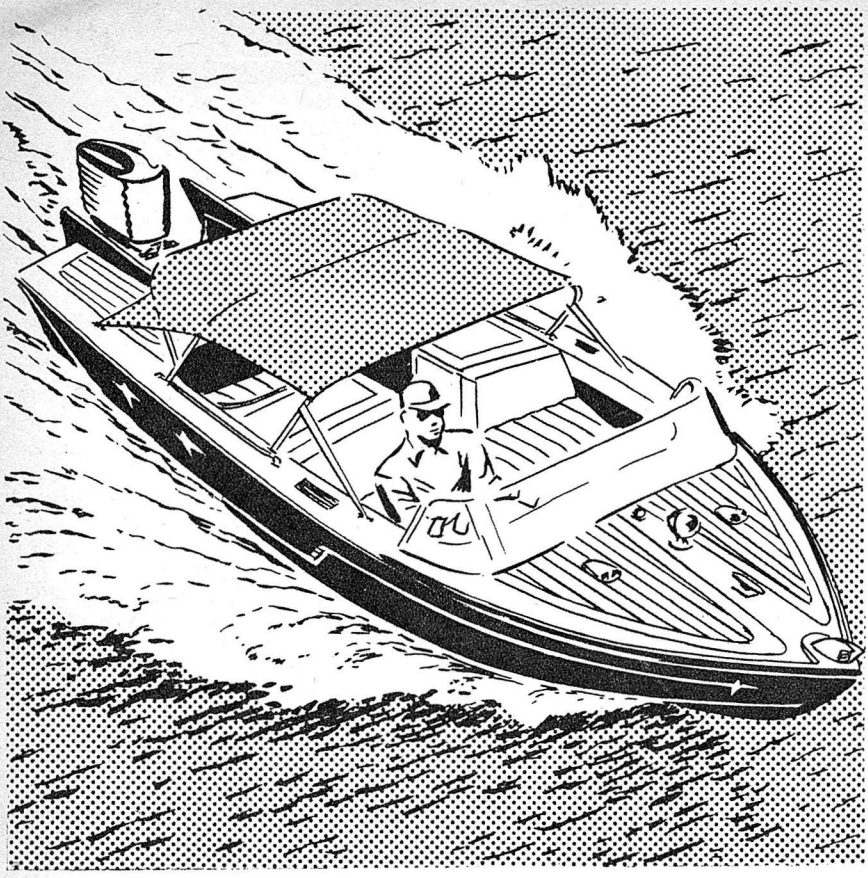
Now, install your hardware and you are ready for a Swell Time. •

The completed—but unpainted—hull is righted. Next construction jobs are deck framing and the installation of supports for the front-seat backs.



The keel view reveals the structural framing of the transom. Remember that both the ribs and the transom are installed at a 14-degree angle.





APACHE

Here's a 16-foot plywood outboard runabout that's perfect for skiing, fishing and all-around family fun.

by David D. Beach

WE are concerned here with the family or group that uses its boat as a picnic spot, cruises with its fellow outboard club members on the lakes and rivers on a Sunday afternoon and tows the youngsters astern on water skis. So let's look at Apache. She is big and beamy, with a good wide bottom to carry a fair passenger load without bogging down excessively. The bottom is easily veed forward to take the chop of confused waves on crowded lakes and restricted waterways. Amidship the sections have enough deadrise, carried well to the transom, to provide a comfortable heel when turning and to prevent any tendency to leap regardless of location of the load. The sides are flared all the way aft to keep random spray from coming aboard and to provide a substantial rub strake at the widest part of the boat. Aft the transom is cut for long lower unit outboard motors, and the high cut-out minimizes the danger of water coming aboard. The bottom aft is 60 inches over the spray rail, insuring proper buoyancy to support the newer and bigger motors, to absorb their starting thrust moment, and to give just the right amount of planing surface for safe and comfortable running.

Six adults can be seated on two seats, each nearly five feet long. Apache is

steered automobile-style from the front seat. The long front deck has ample stowage space for lines and life jackets and keeps the variable passenger load from getting too far forward. The walk-through center deck has two stowage compartments, one of which is fitted as a shallow ice cooler. An overboard drain eliminates the chore of emptying melted ice. The space beneath the rear seat is separated from the gas tank and battery space by a low bulkhead so that items stored there will not end up in the bilge or become stained by gas and oil. Note the similar storage arrangement forward.

CONVERTIBLE CANOPY

The outboard profile view shows a novel canopy top. It may be converted from a full top, fastened to the top of the windshield, to a brougham type open to the sky over the forward seat. In a snap-on, zippered, or roll under and strap version, the advantages are obvious. A chrome or polished aluminum slide bar is fitted outboard of the rear cockpit on either side whereby the canopy top may be folded down behind the passengers. One comment on the choice of hardware for this slide: aluminum fittings do not slide easily on aluminum tubing so chromed brass is best for the tubing if aluminum fittings are used on the ends of the canopy bows. On the outboard profile is shown a trim motif subject to many variations, more or less elaborate. The new salt-water resistant aluminums are easily bent, cut and otherwise prepared for attachment to the hull sides. Purposely omitted from the profile, but shown on the plan view, are modern fins which can be fitted to suit, along the motor cut-out or outboard, of a height and length to please the whims of the builder, but if you want a Coast Guard courtesy inspection decal, do not fit taillights or dual stern lights which can be lit under way.

The searchlight, a much needed item, is shown mounted on the center line clear of leads to the cleats and chocks. A searchlight is not a running light and is only used to locate and identify objects.

The steering wheel is shown on the right-hand side. The wheel specified is one of the most attractive available and comes with a mechanical steering device that works well with all types of motors. While these mechanical steerers are considerably easier to install, they have a little more friction than a pulley and cable installation and as a result require more steering effort. Either the drum actuator or the geared-rack-and-pinion type is fine.

As to the structure of the boat, the construction is well illustrated on the drawings. All the structural items are shown, but the plans assume a bit of knowledge of boat construction. Answers to many of the questions which may arise in the fabrication of the boat may be found in the better books on building small boats.

The lines should be lofted full size and any minor variations from the offsets given should be faired out. There may be some, but they will not be over ⅛ inch and will not be any problem. It pays, almost without exception, to cut all templates a bit full and to fair the frames out on the boat.

The frames are shown with double plywood gussets. They can be assembled on the full-size double-body plan, using screws or corrugated shank nails and good resorcinal grade marine glue. These frames and the transom can be erected on a suitable framing jig. The transom cut-out should be carefully checked against the motor or motors to be used. The dimensions shown on the section forward of the transom are correct for 1957 model engines, but should be checked if later models are to be used. Do not attempt to fit engines of more than 80 total horsepower on this craft. There will be no appreciable increase in speed even with special propellers.

The laminated stem, easily bent and glued up over a sawed form, gives more strength than an old-fashioned stem with forefoot and knee bolted together. When the keel is notched for and bolted into the frames the stem can be fitted to the keel, as shown on the construction profile.

FITTING THE CHINES

The fitting of the chines should be done from aft to forward in notched frames and should proceed simultaneously on both sides. Drill and countersink all through fastenings into the frames to permit plane beveling without striking protruding screw heads. The chines land against the stem on a breast hook bolted through the stem as shown. The sheer stringers, of the same size as the chines, are fitted in the same manner, also landing against an oak breast hook at the stem head.

Fairing the frames for plywood planking requires a certain amount of trial and error. The best method is with a wide (8 inches or so) strip of plywood of the same thickness as the planking and about three frame spaces long. This is laid across the frames to indicate the bevel required. The bevel, or slope to the bottom or outer edges of the frames, is planed in according

Continued on page 21

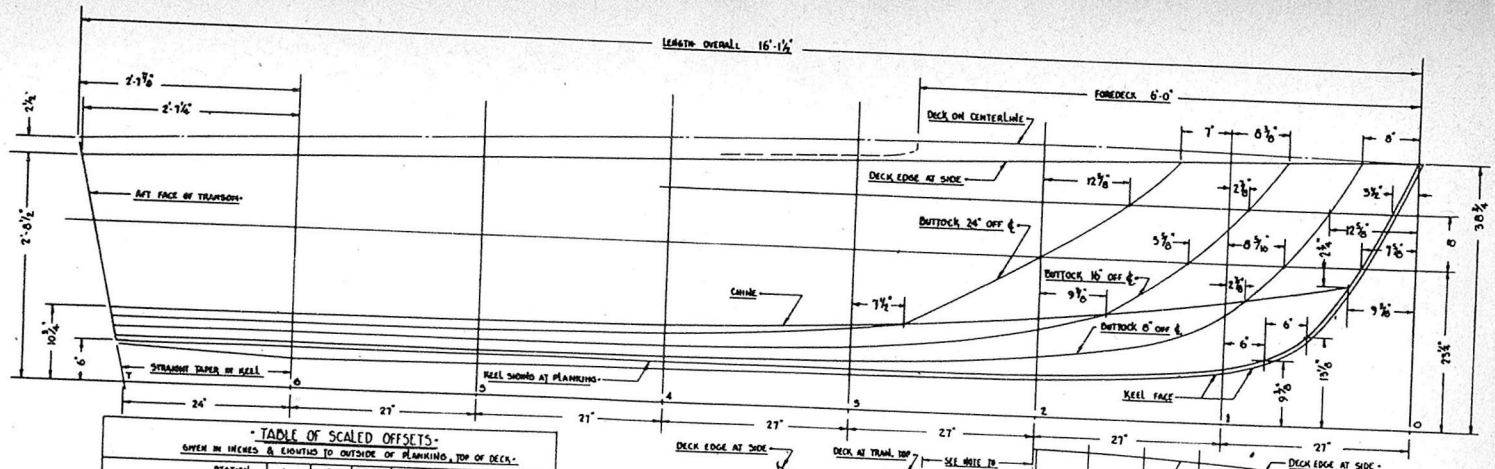
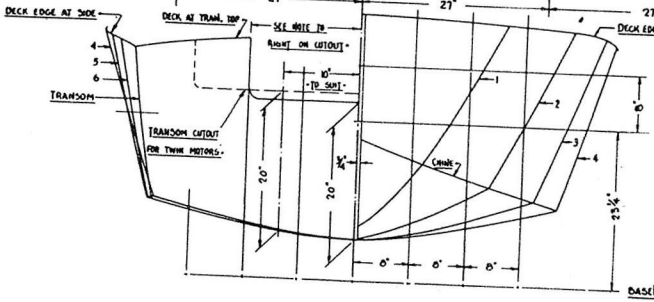


TABLE OF SCALED OFFSETS.

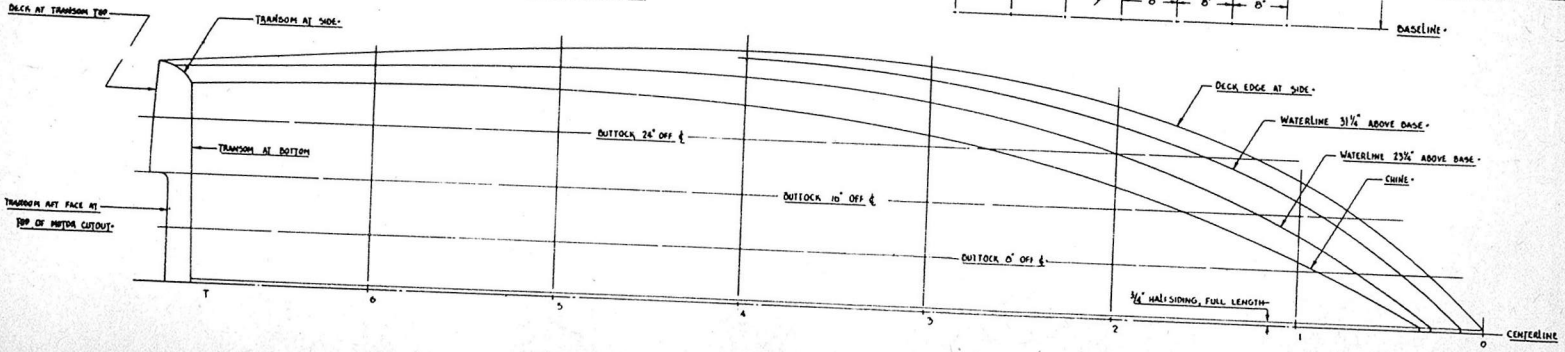
GIVEN IN INCHES & EIGHTHS TO OUTSIDE OF PLANKING, TOP OF DECK.

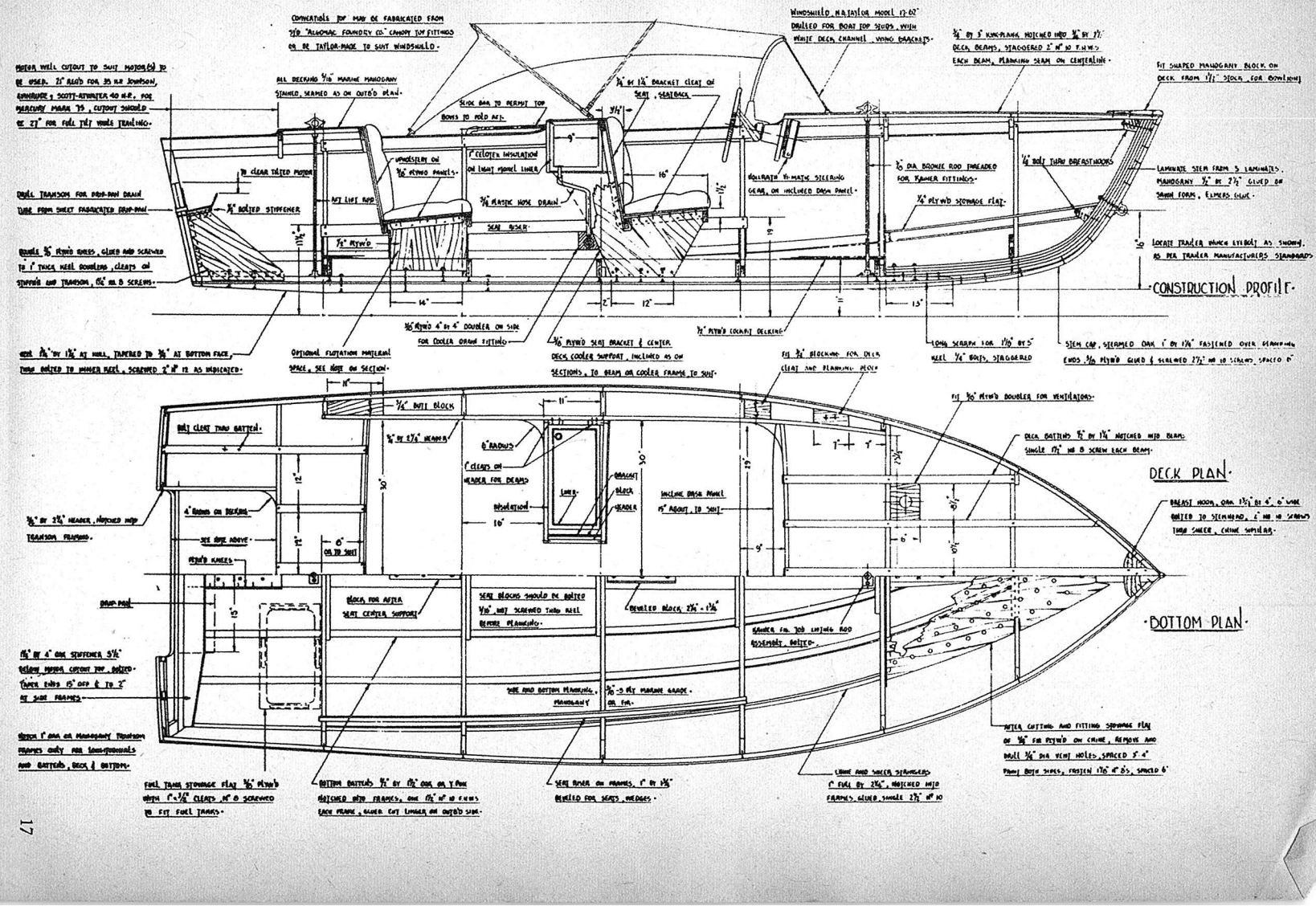
STATION	1	2	3	4	5	6	TRANSOM
HEIGHT, KEEL FACE ABOVE BASE.	1-3	3-3	5-0	4-6	4-4	4-2	5-4
HALFSIDING, KEEL SIDE.	8-0	0-1	6-0	STRAIGHT			0-0
BUTTOCK 0" OFF ℄.	13-5	0-5	7-1	0-5	0-4	6-4	6-4
10"	28-1	12-4	9-0	0-1	0-1	0-1	0-1
24"	-	23-2	11-5	10-0	9-3	9-3	9-3
CHINE	17-4	14-2	12-2	11-1	10-6	10-6	10-6
DECK EDGE AT SIDE.	36'-0	STRAIGHT					32-4
AT CENTERLINE.	39-2	39-4	39-1	38-2	37-2	36-1	35-0
HALF-BREADTH - CHINE	9-4	19-3	25-4	28-7	30-1	30-0	29-2
WL 23¾" ABOVE BASE.	13-0	24-0	30-4	33-0	33-2	32-5	31-5
31⅛"	17-7	28-2	33-5	35-6	-	-	-
DECK EDGE AT SIDE.	21-8	30-7	35-6	36-0	36-1	34-5	32-2

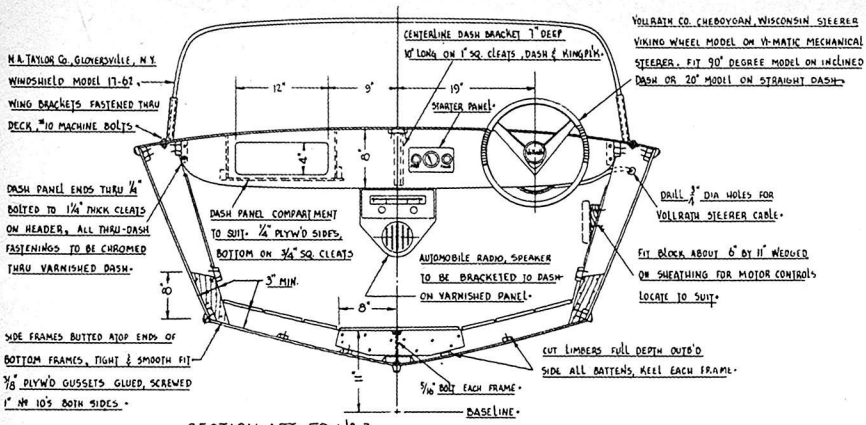


FOR LOCATION OF FRAMES & STRUCTURE IN RELATION TO STATION LINES SEE CONSTRUCTION PLAN.

CHECK WITH MANUFACTURER'S MOTOR CLEARANCE RECOMMENDATIONS BEFORE CUTTING MOTOR MOUNT. CUTOUT HEIGHT DETAILED FOR LONG (20") LOWER UNITS.

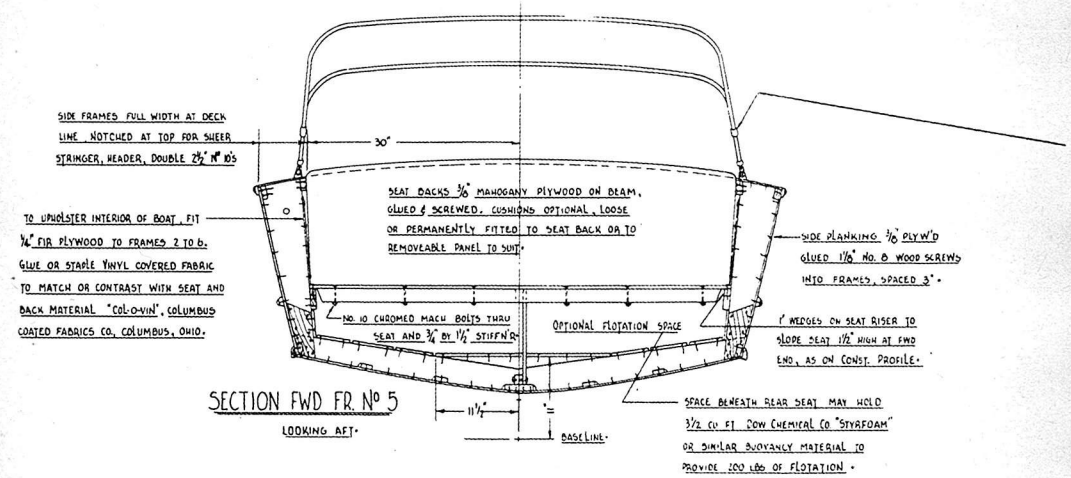



CONSTRUCTION PROFILE.
DECK PLAN.
BOTTOM PLAN.
MOTOR WELL CUTOUT TO SUIT MOTOR(S) TO BE USED. 25" REQ'D FOR 35 H.P. JOHNSON, EVINRUDE & SCOTT-ATWATER 40 H.P. FOR MERCURY MARK 75, CUTOUT SHOULD BE 27" FOR FULL TILT WHILE TRAILING.
CONVERTIBLE TOP MAY BE FABRICATED FROM 2"/0 "ALGOMAC FOUNDRY CO." CANOPY TOP FITTINGS OR BE TAYLOR-MADE TO SUIT WINDSHIELD.
WINDSHIELD, M. TAYLOR MODEL 17-62" DRILLED FOR BOAT TOP STUDS, WITH MINUTE DECK CHANNEL, WING BRACKETS.
¾" BY 5" KING-PLANK NOTCHED INTO ¾" BY 1½" DECK BEAMS, STAGGERED 2" AT 30 T.P.M. EACH BEAM, PLANKING SEAM ON CENTERLINE.
FIT SHAPED MAHOGANY BLOCK ON DECK FROM 1½" STOCK, FOR DOWELING
ALL DECKING ⅜" MARINE MAHOGANY STAINED, SEAMED AS ON OUTB'D PLAN.
SLIDE BAR TO PERMIT TOP BOWS TO FOLD AFT.
¾" BY 1¾" BRACKET CLEAT ON SEAT & SEATBACK
3¼"
9"
16"
1½"
19"
LAMINATE STEM FROM 5 LAMINATES, MAHOGANY ¾" BY 2½" GLUED ON SHAPE FORMS, ELMERS GLUE.
⅜" DIA BOOMIE ROD THREADED FOR KROMER FITTINGS.
⅛" PLYW'D STOWAGE FLAP.
⅜" BOLT THRU BREASTHOOKS
DRILL TRANSOM FOR DRAIN-PAN DRAIN TUBE FROM SHEET FABRICATED DRIP-PAN
¾" BOLTED STIFFENER
¾" CLEAR TILTED MOTOR
MET LIFT ROD
WINDSHIELD ON ⅜" PLYWD PANELS.
1" CELOTEX INSULATION ON LIGHT MONEL LINER
¾" PLASTIC HOSE DRAIN
SEAT RISER
¾" PLYW'D
11½"
16"
12"
15"
ROLLWAY V-MATIC STEERING GEAR, ON INCLINED DASH PANEL.
DOUBLE ⅜" PLYWD RISERS, GLUED AND SCREWED TO 1" THICK KEEL DOUBLERS, CLEATS ON STRINGER AND TRANSOM, 1¼" NO. 8 SCREWS.
LOCATE TRAILER WINCH EYEBOLT AS SHOWN, AS PER TRAILER MANUFACTURERS STANDARDS
KEEL ⅞" BY 1⅜" AT KEEL, TAPERED TO ⅜" AT BOTTOM FACE, THRU BOLTED TO INNER KEEL, SCREWED 2" NO 12 AS INDICATED.
OPTIONAL FLOTATION MATERIAL SPACE, SEE SIDE ON SECTION.
⅜" PLYW'D SEAT BRACKET & CENTER DECK COOLER SUPPORT, INCLINED AS ON SECTIONS, TO BEAM OR COOLER FRAME TO SUIT.
½" PLYW'D (COLREN) DECKING
LONG SCARPH FOR 1⅛" BY 5" KEEL ¾" BOLTS, STAGGERED
STEM CAP, STEAMED OAK 1" BY 1¾" FASTENED OVER STANDING ENDS ⅜ PLYW'D GLUED & SCREWED 2½" NO 10 SCREWS, SPACED 6"
FIT ¾" BLOCKING FOR DECK CLEAT AND PLANKING SEAM
FIT ⅜" PLYW'D DOUBLER FOR VENTILATION.
DECK BATTENS ¾" BY 1¾" NOTCHED INTO BEAM, SINGLE 1½" NO 8 SCREW EACH BEAM.
BREAST HOOK, OAK 1½" BY 6" BY 6" WIDE BOLTED TO STEM HEAD, 2" NO 10 SCREWS THRU SHEER, CHINE SIMILAR.
¾" BUTT BLOCK
¾" BY 2¾" HEADER
11"
30"
6" RADIUS
4" CLEATS ON HEADER FOR BEAMS
INSULATION
LINER
BRACKET
BLOCK
HEADER
INCLINE DASH PANEL 15° ABOUT, TO SUIT
29"
24½"
30½"
9"
6"
BOLT CLEAT THRU BATTEN.
4" RADIUS ON BEARING
SEE SIDE ABOVE
12"
6" ON TO SHEET
¾" BY 2¾" HEADER, NOTCHED INTO TRANSOM FRAMING.
PLYW'D KNEES
DRIP PAN
BLOCK FOR AFTER SEAT CENTER SUPPORT
SEAT BLOCKS SHOULD BE BOLTED ⅜" NOT SCREWED THRU KEEL BEFORE PLANKING.
BEVELED BLOCK 2¾" - 1⅜"
KROMER FIG. 308 ENGINE ROD ASSEMBLY, BOLTED.
⅜" BY 4" OAK STIFFENER 5½" BELOW MOTOR CUTOUT TOP, BOLTED THRU KEEL ENDS 15° OFF ℄ TO 2" AT SIDE FRAMES.
SIDE AND BOTTOM PLANKING, MAHOGANY ⅜"-3 PLY MARINE GRADE OR EQ.
SEVEN 1" OAK OR MAHOGANY TRANSOM FRAMES ONLY FOR SIDE-MOUNTS AND BATTENS, DECK & BOTTOM.
AFTER CUTTING AND FITTING STOWAGE FLAP OF ⅛" PLYW'D ON CHINE, REMOVE AND DRILL ¾" DIA VENT HOLES, SPACED 5'-0" FROM BOTH SIDES, FASTEN 1¼" #8 S.S., SPACED 6'
FUEL TANK STOWAGE FLAP ⅜" PLYW'D WITH ¾"-1⅛" CLEATS 16" O SCREWED TO FIT FUEL TANKS.
BOTTOM BATTENS ¾" BY 1½" OAK OR Y PINE NOTCHED INTO FRAMES, ONE 1¼" NO 10 SCREWS EACH FRAME, GLUED CUT LENGTHS ON OUTB'D SIDE.
SEAT RISER ON FRAMES, ¾" BY 1½" BEVELED FOR SEATS, WEDGES.
CHINE AND SHEER STRINGERS ¾" FIBS BY 2¼", NOTCHED INTO FRAMES, GLUED, SINGLE 2½" NO 10



SECTION AFT FR N° 3

· LOOKING FORWARD ·



SECTION FWD FR N° 5

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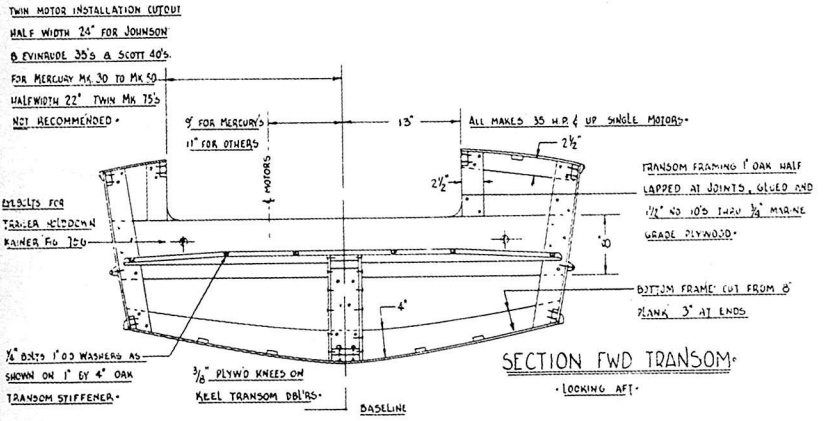
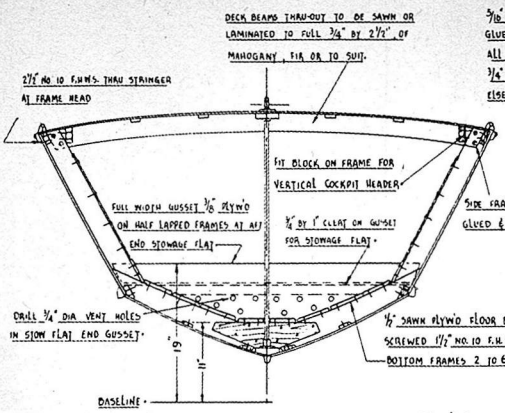


SECTION FWD TRANSOM.

· LOOKING AFT ·



SECTION AFT FR N°7

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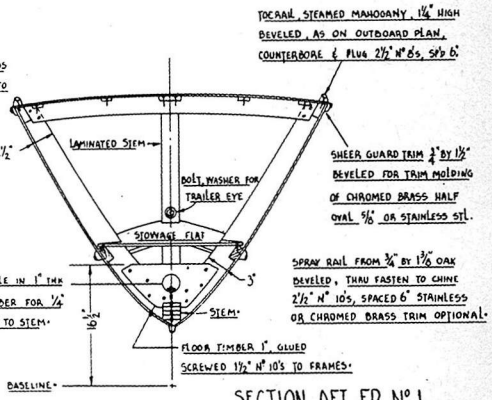

SECTION AFT FR N°1

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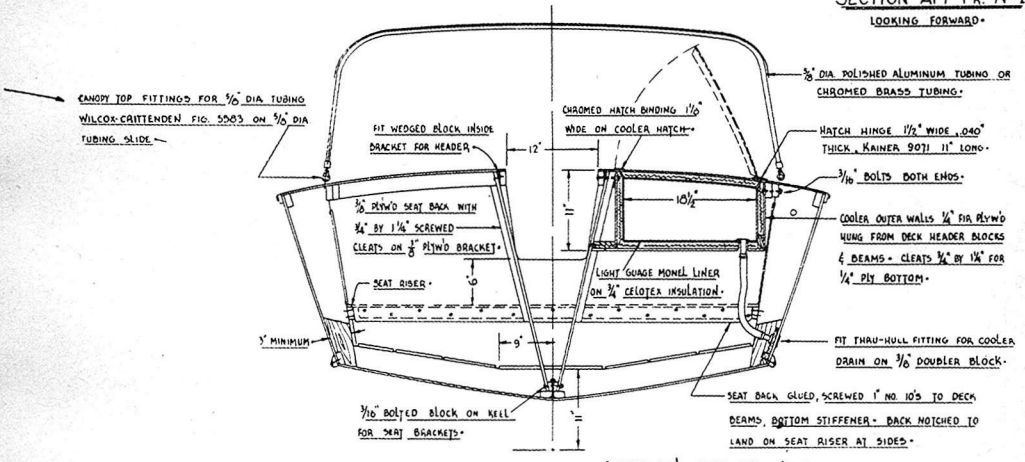

SECTION AFT FR N° 4

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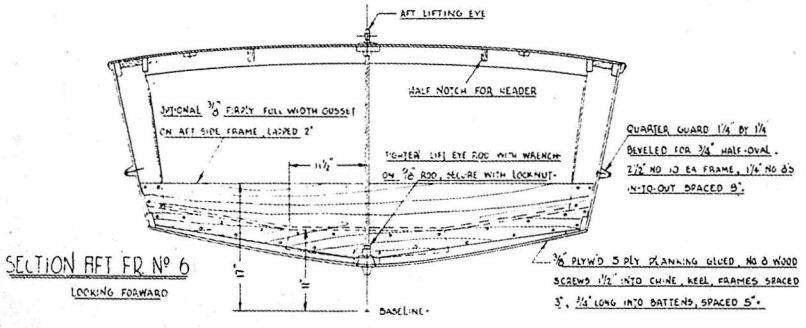
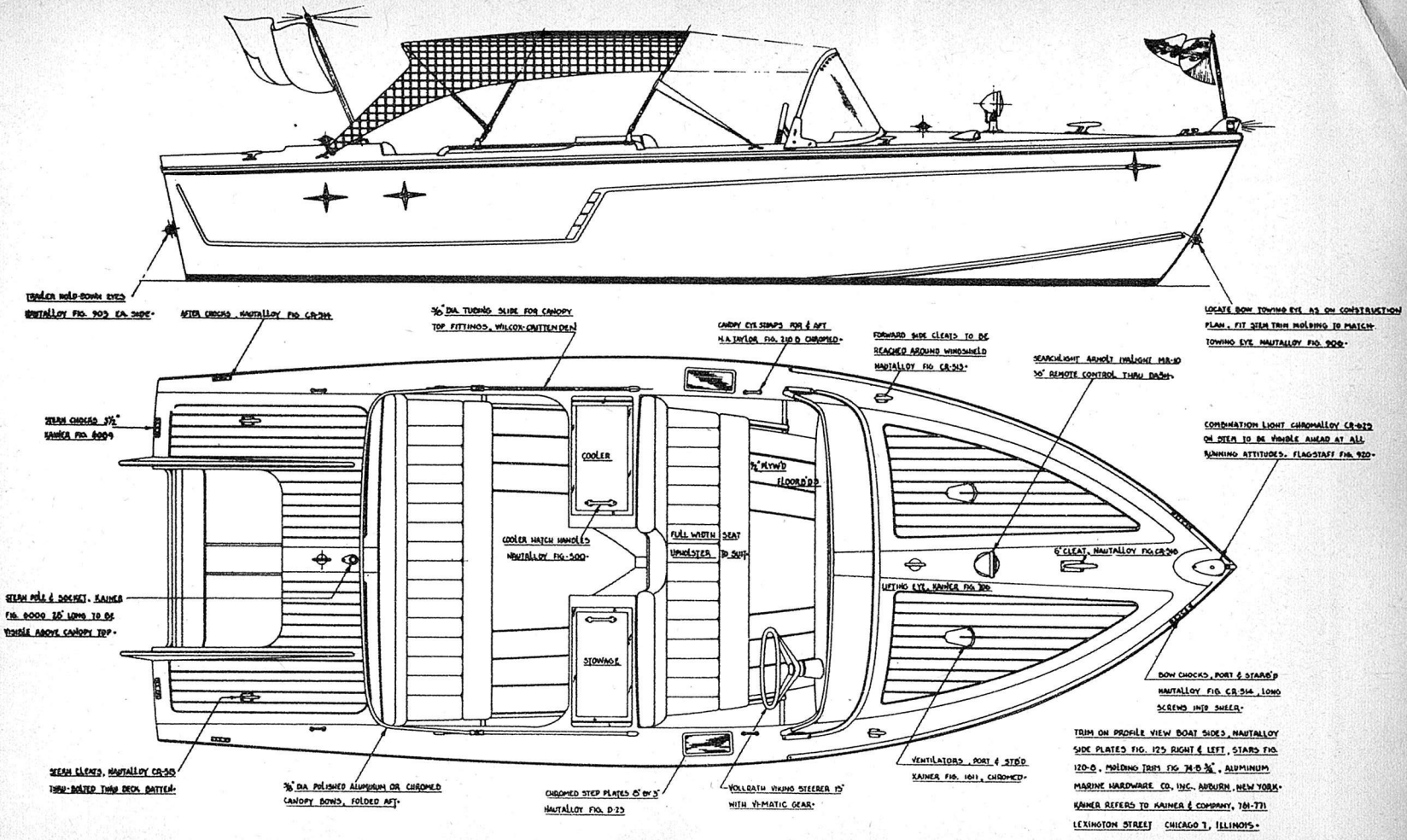


SECTION AFT FR N° 6

LOOKING FORWARD



TRIM ON PROFILE VIEW BOAT SIDES, NAUTALLOY SIDE PLATES FIG. 125 RIGHT & LEFT, STARS FIG. 120-D, MOLDING TRIM FIG 74-D 3/8", ALUMINUM MARINE HARDWARE CO., INC., AUBURN, NEW YORK. KAINER REFERS TO KAINER & COMPANY, 701-771 LEXINGTON STREET CHICAGO 7, ILLINOIS.

to the indications of the plywood strip. The keel, chines, stem and sheer are shaped in this manner. By laying the strip diagonally across the bottom from keel to chine so as to cross at least two frames, all the bevels can be cut. When the planking is properly beveled the notches for the bottom battens can be cut. These battens are to be located as shown on the bottom plan with their forward ends running out against the keel or stem at the two forward frames. When they are fitted they should be checked for fairness with the wide plywood strip.

PLYWOOD PLANKING

Obviously if the designer's layout of the plywood development is correct, if the lines are lofted correctly, and if the pressed down test plywood strip lies full and smoothly across the structure regardless of the angle at which it is placed, then the ⅜-inch plywood will wrap on with little difficulty. The sides go on first and the bottoms last, the bottoms being carefully fitted so as to butt together at the center line. It is well to clamp down the plywood panels before fastening them, then crawl underneath to check the landing of the plywood on the frames and other structures. If your strip fairing was slightly off, a little more planing or a bit of shimming might be indicated.

The sea blocks and lifting eyebolts should be fitted before the planking is applied. These bolts should not be forgotten as the fewer holes through the hull structure the better.

The stem band and the small outer keel are next fitted over the centerline butt of the planking which has been planed smooth. Bed these members well in good glue before fastening. Locate the scarph joint behind frame 2 so that the steam-bent stem band will be taken from a piece about 7 feet 6 inches long.

The spray rails and the sheer guard strip must be fastened before the boat can be turned right side up. Note that the spray rail does not form a smooth extension of the bottom. Rather it is at a slight downward angle to deflect the spray.

The deck beams, sawed to the camber indicated by the lines plan, are bolted to the frames forward and aft. The cockpit header, of mahogany or fir, is notched into the frame heads as shown. All the deck structure is straightforward, needing almost no explanation. The centerline brackets are a little unorthodox in that they are inclined from the vertical as the sections show. These are bolted through the bracket blocks on the keel and also bolted to the seat cleats. Careful scheduling of the seat risers, seat structure, dash panel, seat brackets, center deck cooler and the like must be followed if no trouble in the completion of the boat is to be expected. A certain latitude in the details of the cooler and stowage box is shown, or they need not be fitted. The transom knees and the transom stiffener should be carefully fitted if twin motors are used. The stiffener should be 1¼ inches thick for twin installations.

DECKING

The decking should be mahogany plywood for best appearance. The use of router scoring, or white pencil marking, or multicolor staining will be left entirely to the builder. If fir plywood is used it should not be varnished, but a good marine paint applied over undercoats of sealer and primer. The side and bottom treatment of color will depend on the planking material.

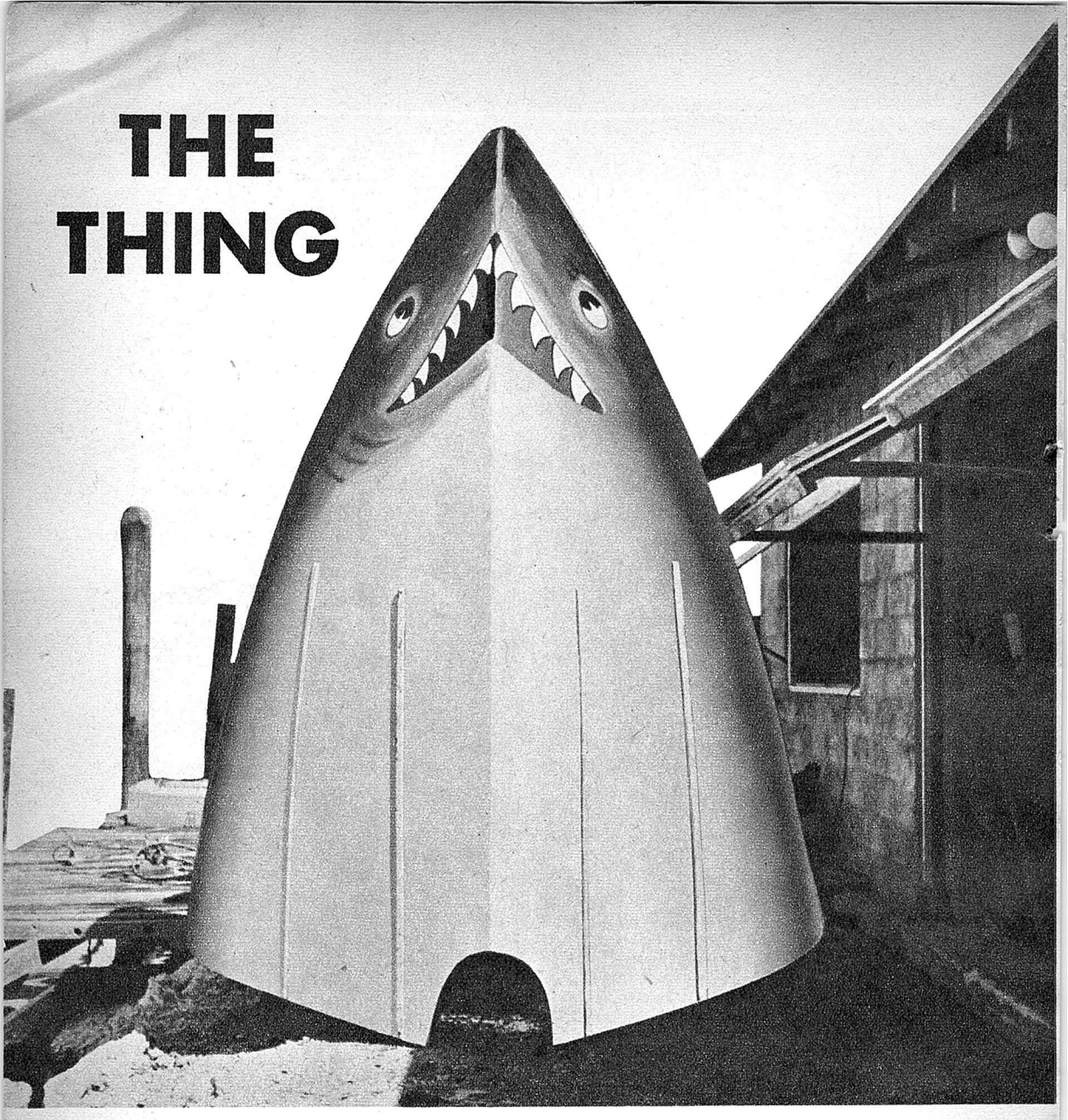
The hardware, trim, windshield, upholstery and canopy top add the finishing touches. I consider that lifting eyes are a nice feature, especially where the boat is launched from a hoist as they eliminate the use of paint smudging slings. Be as elaborate as you can in the matter of upholstery and trim. The upholstered interior side panels, shown on the section at frame 5, make a big improvement inside. If the local shop makes your convertible top, look at the collection of plaid sport topping. The ready-made tops specified in the drawings are available in some colors.

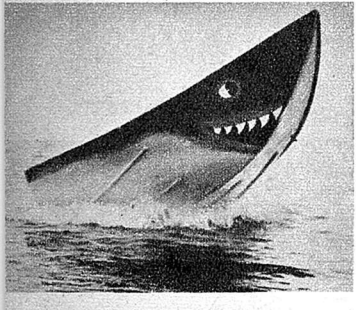
ELECTRIC STARTING

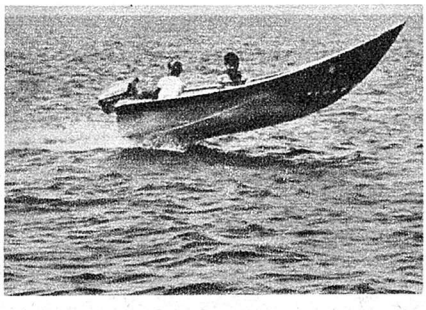
The fuel-tank platform, remote engine controls and the like should be installed in accordance with the recommendation of the motor manufacturer. The battery of electric-starting motors may be located forward of the last frame on the starter-panel run through holes cut in the wide frame heads.

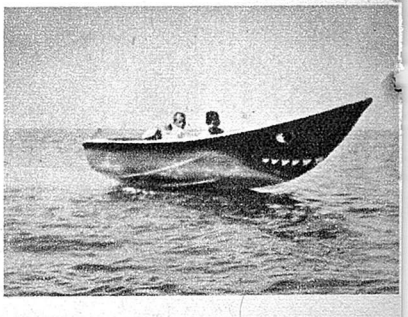
Finally, if you are boating on salt water or on navigable rivers this boat must be registered. Apply to the local custom house for the application form. The registration number, in 3-inch figures, must be shown on both sides of the bow. •

THE THING

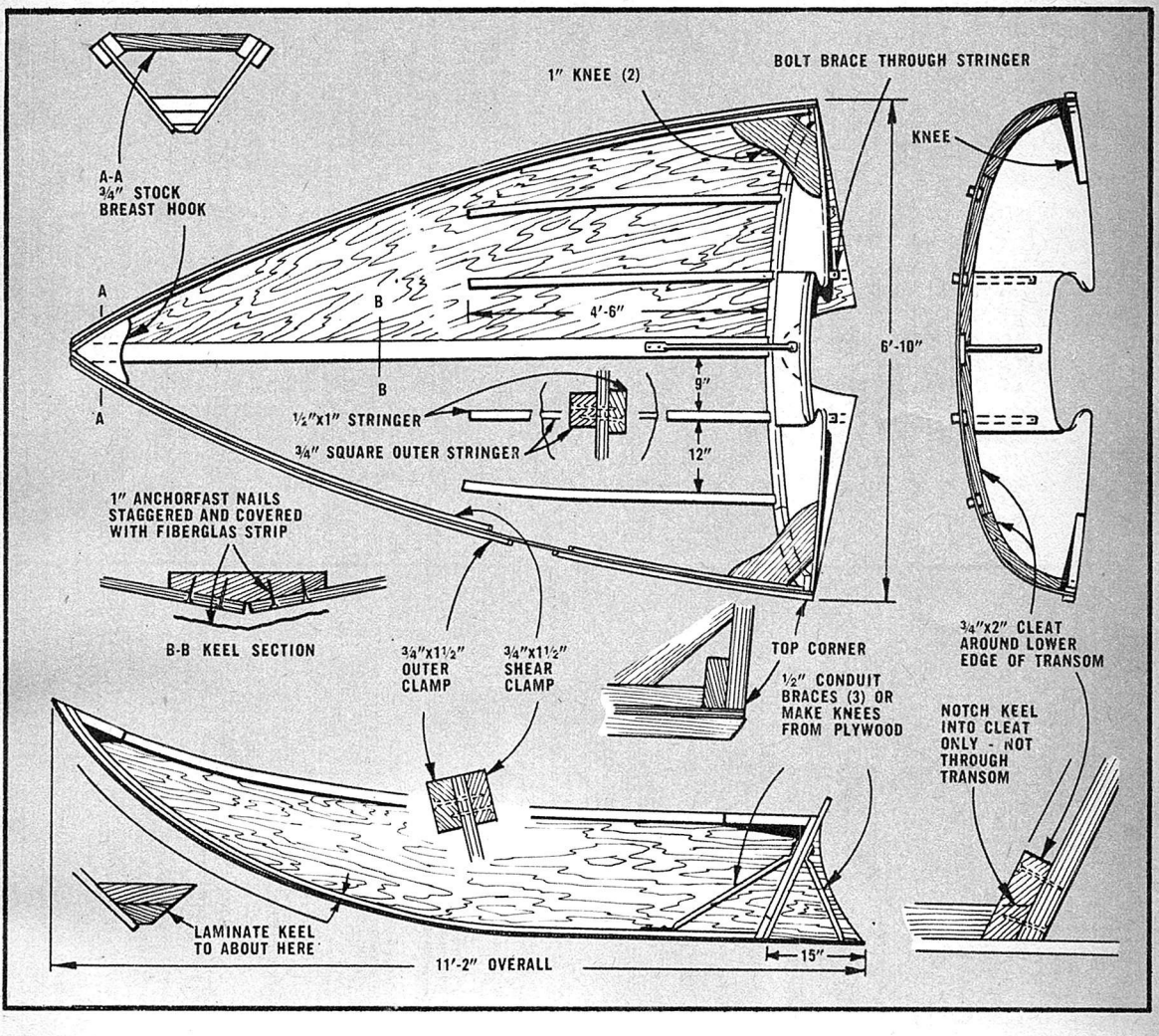


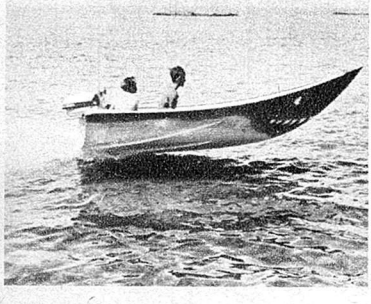


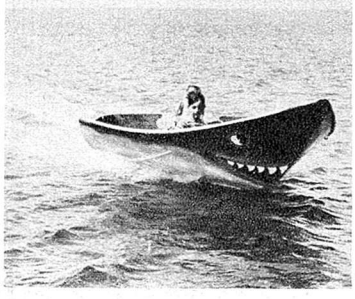




Unconventional? Yes. But it really does perform and it costs only $60 to build.



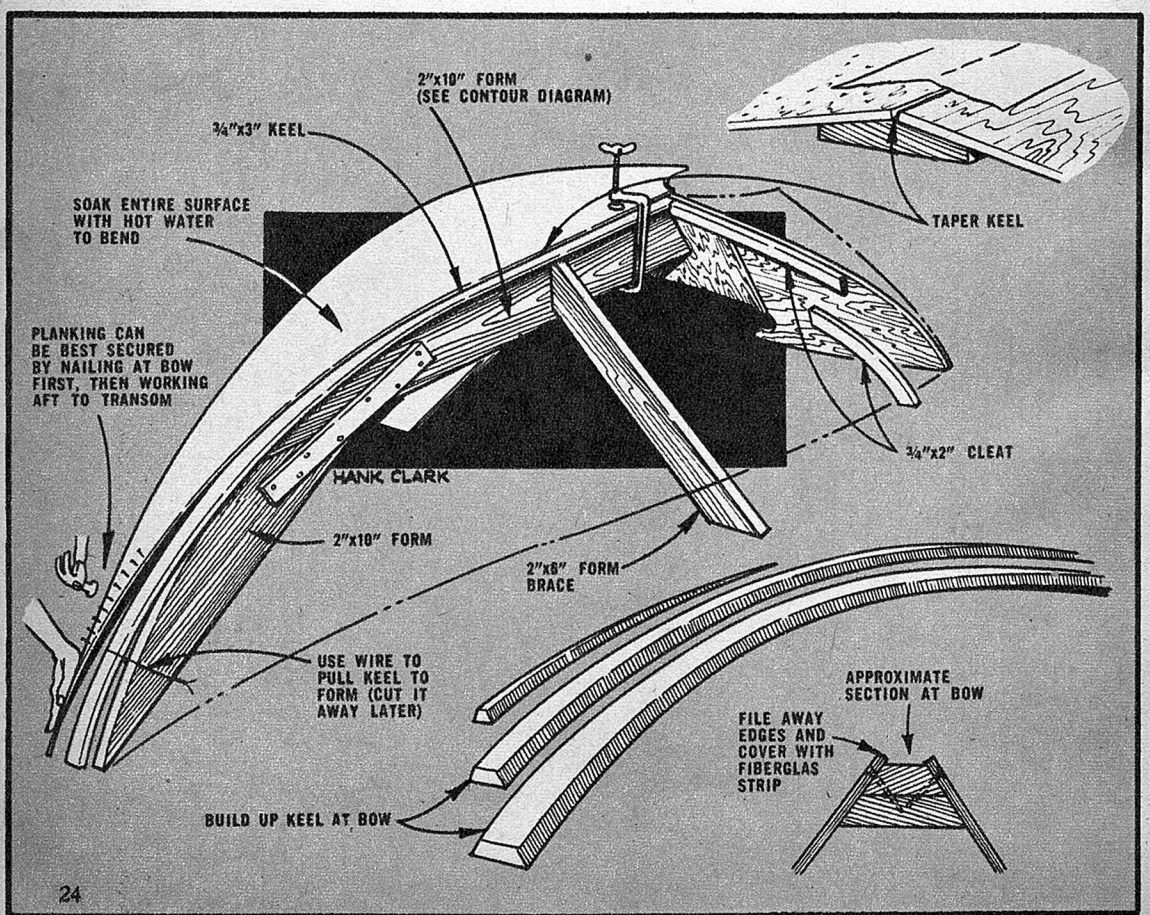


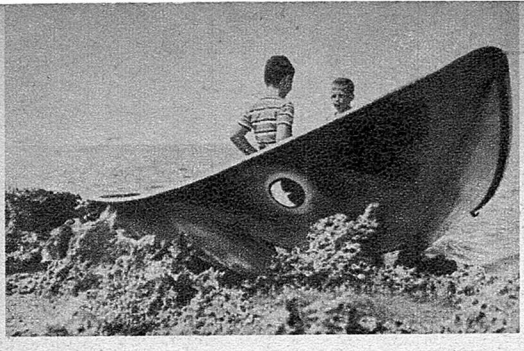


The transom is braced inside and out since the skin extends beyond the keel with a cutout for the motor.

IF you're in or on the water near Marathon, Florida, and happen to spot what appears to be a sea monster bearing down, don't die of heart failure—it's probably nothing more than Al Bayles' Thing. All who see it say it's the darndest boat ever built, but they have to admit it performs. The Thing has great maneuverability and literally flies across the surface. Under full power of a 10-hp motor, little more than the prop and the keel remain in the water. And 10 hp is all that Al recommends—any more and The Thing assumes control!

Al built his unusual boat for $60 and it weighs just about the same in pounds. Though the bend in the ¼-in. plywood hull planking may appear extreme, it is not difficult to accomplish. The nature of construction, with the transom angled and beveled, is such that the curves are of large radius and the plywood can be fastened in place with no more than the usual amount of soaking with hot water. In doing this,

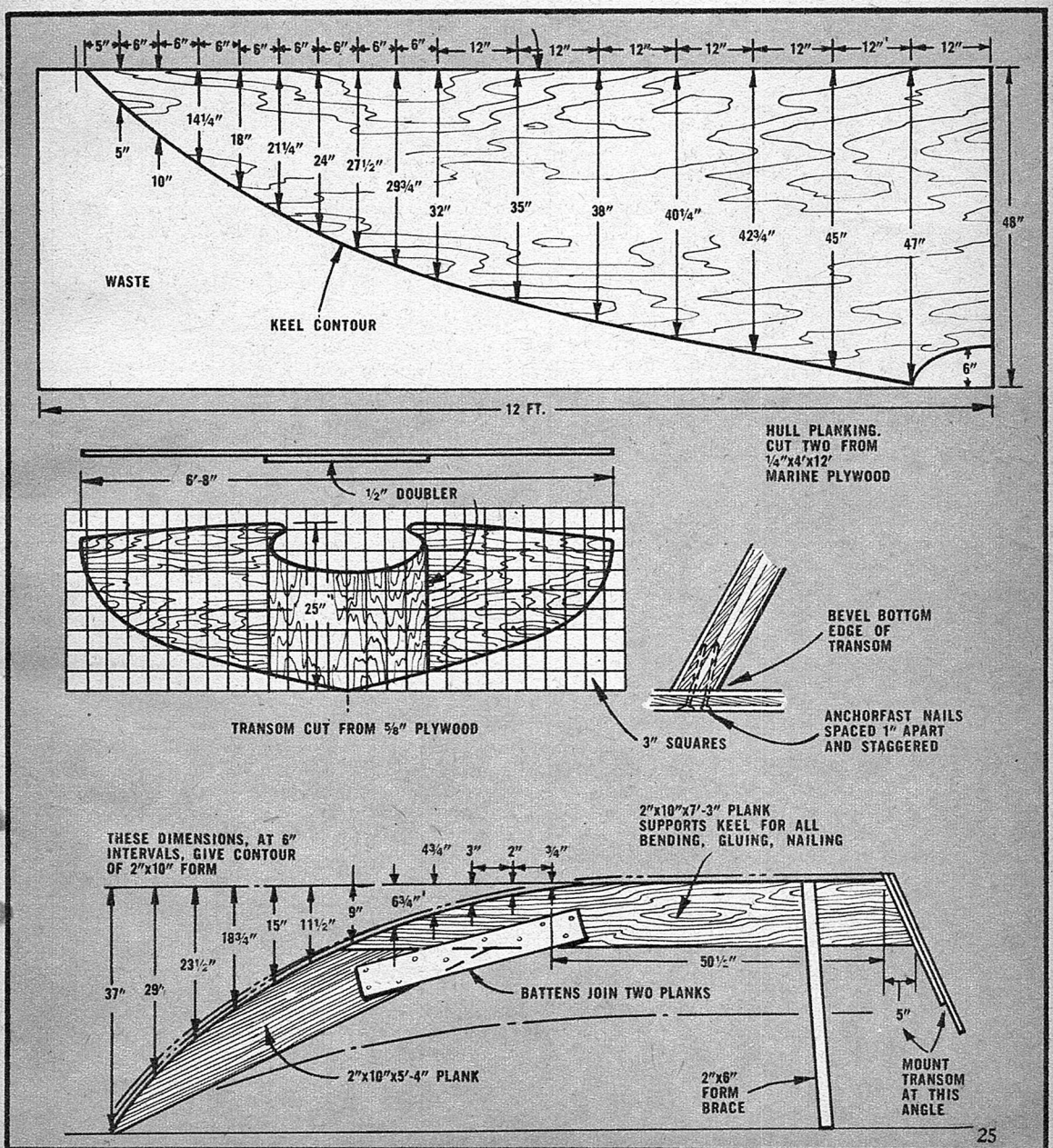


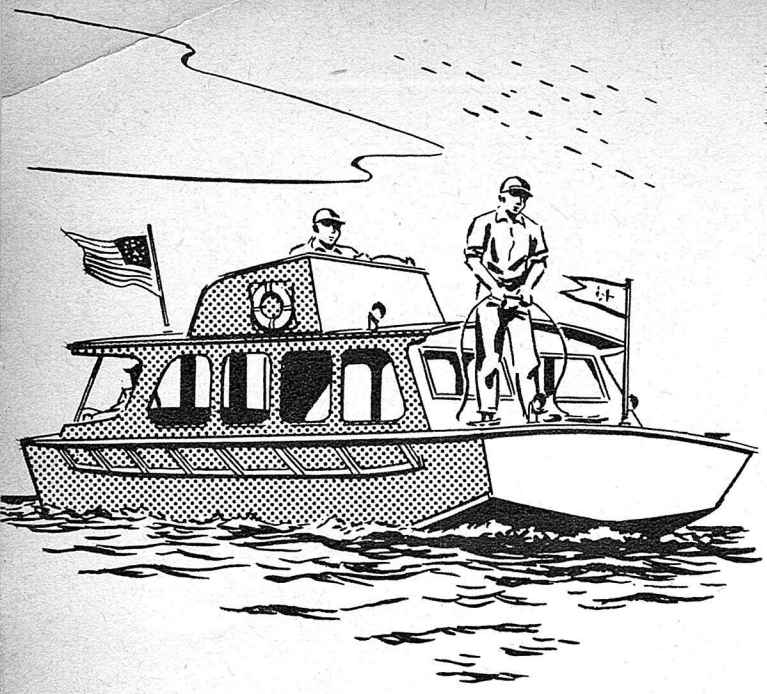


The Thing, weighing 60 pounds, is easily beached.

the sheer assumes its own contour and the addition of a few knees and braces makes the boat.

For Al, The Thing was an experiment and he didn't span the hull with seats because he felt this would make it too rigid. He also was afraid the outward pressure would create a tendency for the hull to pop apart. However, the boat has carried five people with a gross weight of 800 pounds without any sign of undue stress. •





BAYOU BELLE

by David Beach

This 24-foot outboard river cruiser boasts the comforts of home.

BAYOU BELLE provides one designer's solution to the search for an ideal river cruiser, and does so with the capabilities of the average small boat builder as a prime consideration. The structure is simple to fabricate and assemble, utilizing exterior grade fir plywood wherever possible. The structural members are of oak or yellow pine although locally available woods of equal strength are entirely satisfactory. Only a band saw and a tilting bed table saw are required besides the usual chest of hand woodworking tools and a power drill with screwdriver attachment.

The outboard plan and profile shows a big pram-like hull on which is mounted a long cabin with four large windows on each side. Forward there is a small deck. Aft there is a cockpit and motor compartment covered with an extension of the cabin roof. A topside steering station, not unlike those used on deep water game fishermen, is placed on the cabin top and a hatch in the cockpit roof gives access to the top. The plan view shows that a slatted side deck has been provided which runs the full length of the boat on both sides. Side braces support these decks, a touch that is reminiscent of old river craft. The inboard profile and arrangement plan illustrates the manner in which the space provided by the pram-type hull is utilized.

The area beneath the foredeck and in the forward part of the cabin is used for a pair of berths, divided at their heads by a bit of floor space and separated from the remainder of the cabin by a pair of low lockers. To port one of the lockers doubles as a steering stand, behind which a folding helmsman's seat is fitted. Opposite, a divan makes up into a double berth and serves as seats for the dining table, shown in dotted lines. The table stows in the low lockers to starboard. A galley counter is installed behind the steering station and the toilet compartment occupies the corner opposite. The full length hanging space is fitted on the centerline and the space on top can be utilized for a radio or whatever is desired. Two folding deck chairs are shown in the cockpit. There are fuel tanks beneath fore and aft lockers built against the sides of the cockpit. Note that the cabin arrangement permits a chair at each end of the dining table. The ladder to the cabin top goes up the cabin bulkhead through the cockpit canopy while a double-hinged hatch covers the motors.

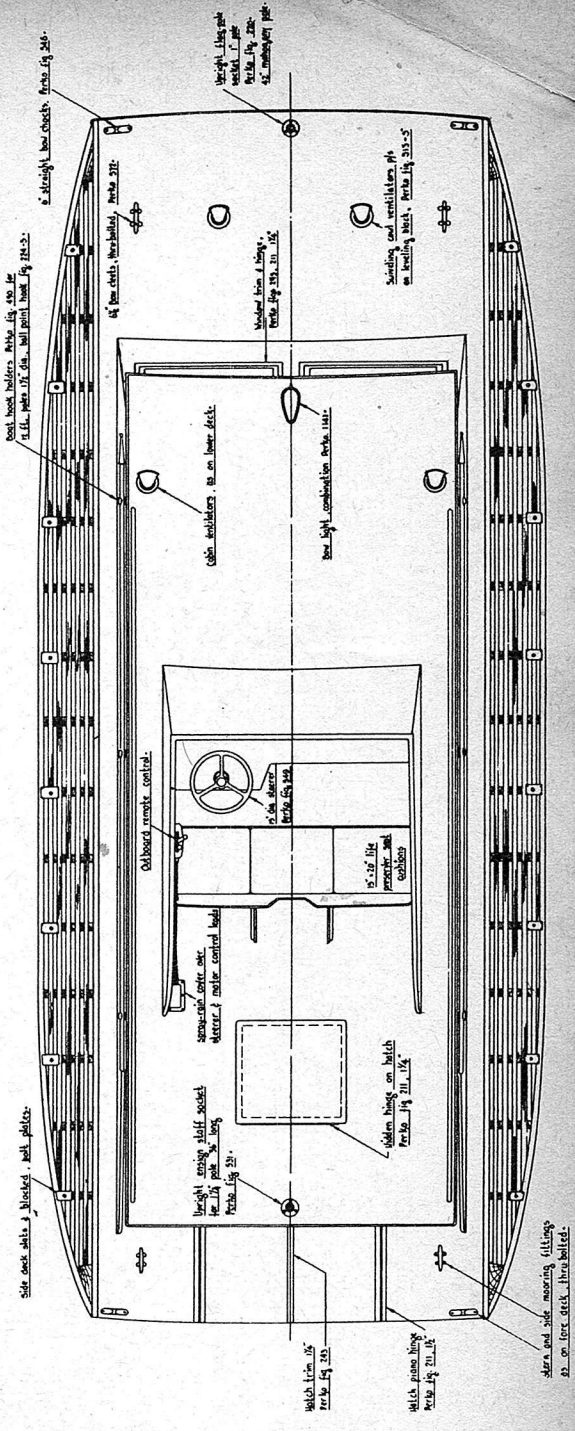
The lines and offsets define the form of the boat to the builder. It is important that at least the bow and stern lines and sections be drawn full size. The middle of the boat is rectangular, frames 3, 4, and 5 being identical except for sheer height. The bow sections are slightly veed and have a considerable lift to both keel and chine. The sections aft are flat athwartships with a bit of rocker to the keel and chine. A standard camber of three inches in seven feet eight inches of beam is detailed, which

permits all decks beams to be cut from one template.

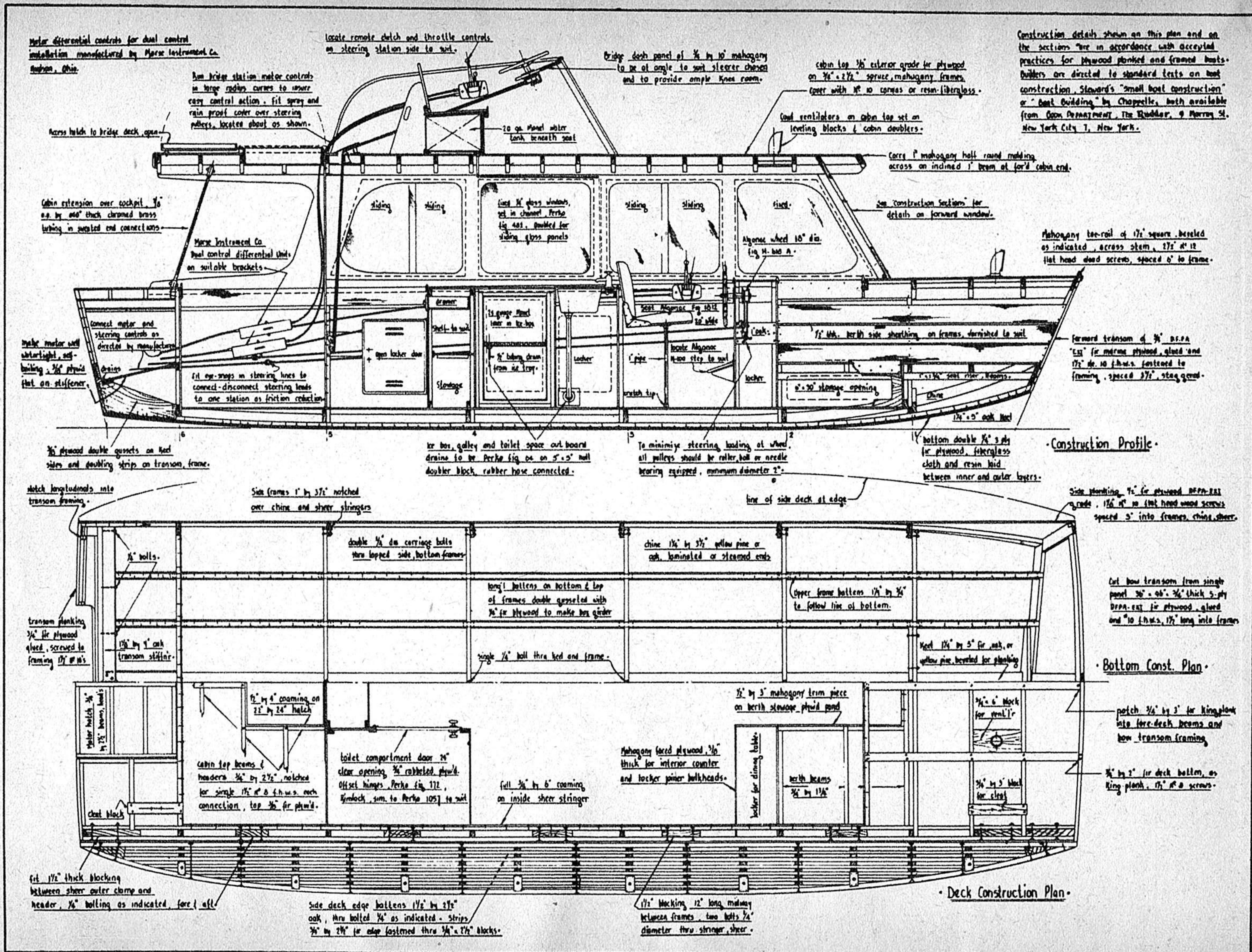
The construction plan and profile, together with the sections, show the details of the hull, cabin and interior. As can be seen, the bottom structure comprises four longitudinal box girders, plus the chines and keel, supported by six transverse frames and the two transoms. Where possible plywood bulkheads tie the sides and bottom together to provide a very strong structure. The chine forward tucks in and upward, which gives the only winding or changing bevel on the hull. Every other piece of wood is capable of being cut on the band saw or table saw. The longitudinals comprise the bottom battens and those battens notched into the tops of the transverse beams for support of the cabin deck. Double plywood gussets between frames tie these battens together into a rigid structure. All plywood-to-structural-member joints are glued and screw fastened for which a waterproof resorcinol base glue is required. Fastenings should be of brass or bronze as indicated on the drawing, or of cadmium-plated steel for fresh-water use if desired. All paint should be the best marine grade, applied as directed.

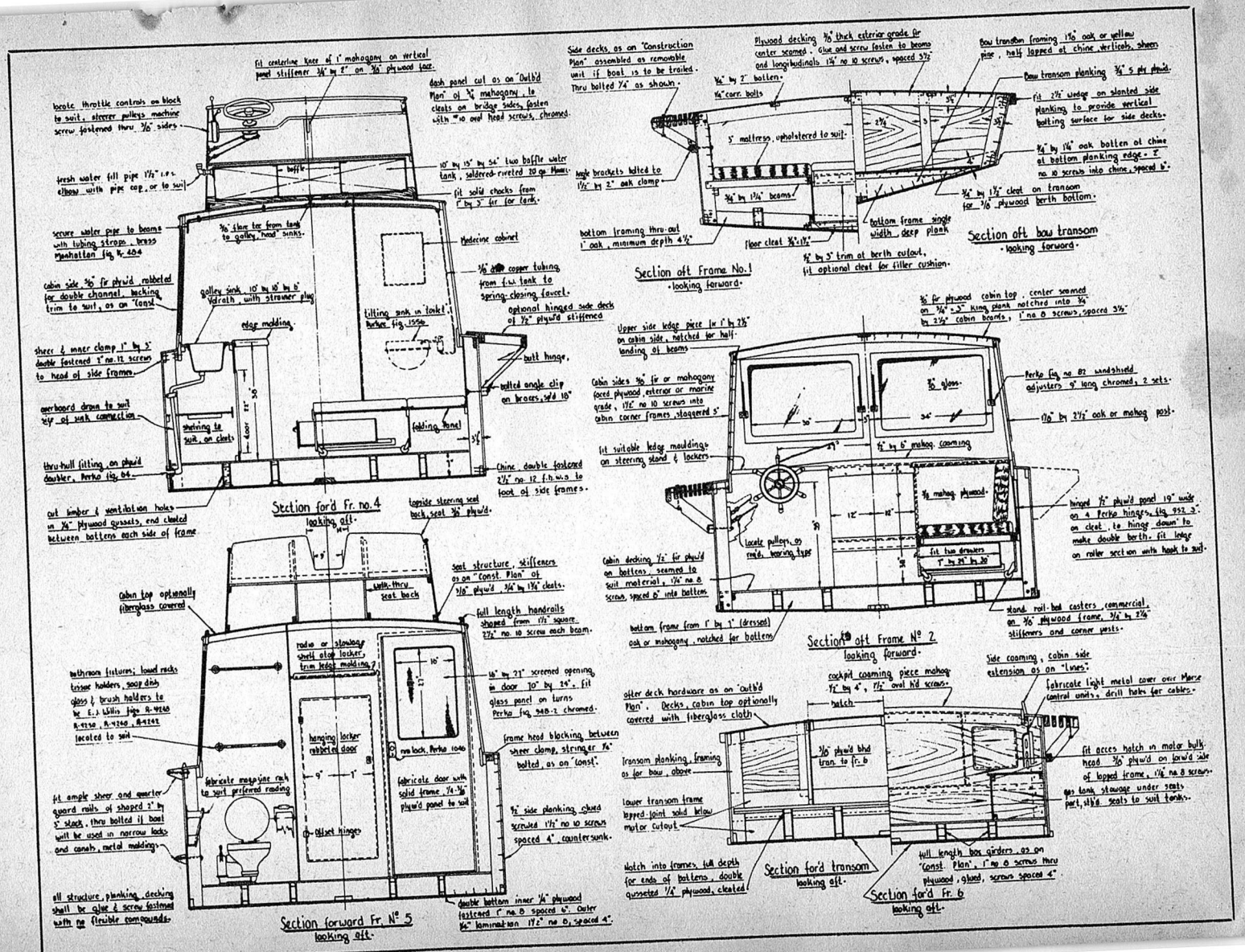
The controls are a bit novel. Both steering stations have complete engine and steering controls. The steering is by plastic-covered wire rope over roller-bearing or ball-bearing pulleys. The wire leads should be about as shown and fitted with guards where they are thought necessary. To reduce the friction load on the helmsman the two wheels are individually connected to the motors through snap hooks on the motor end of the ropes as shown. While this is not a necessity it does eliminate the extra effort on the part of the helmsman of having to turn both wheels and pulleys in addition to the motors. The two clutch and throttle controls operate through a differential unit also shown on the construction profile. Fit a metal guard over these units so that the lubricant thereon will not soil clothes and the units will be protected from rain and spray.

A word of caution. Bayou Belle is not a seagoing craft and is not capable of high speeds. She is not to be expected to venture out on broad expanses of water where heavy waves may be encountered. She will cruise comfortably under the urging of 25 horsepower, but more than that will be wasted or inefficiently used. Her best speed will be about eight or nine miles an hour, attainable with one large or two medium-sized motors, on the flat placid waters of our inland rivers and lakes. •

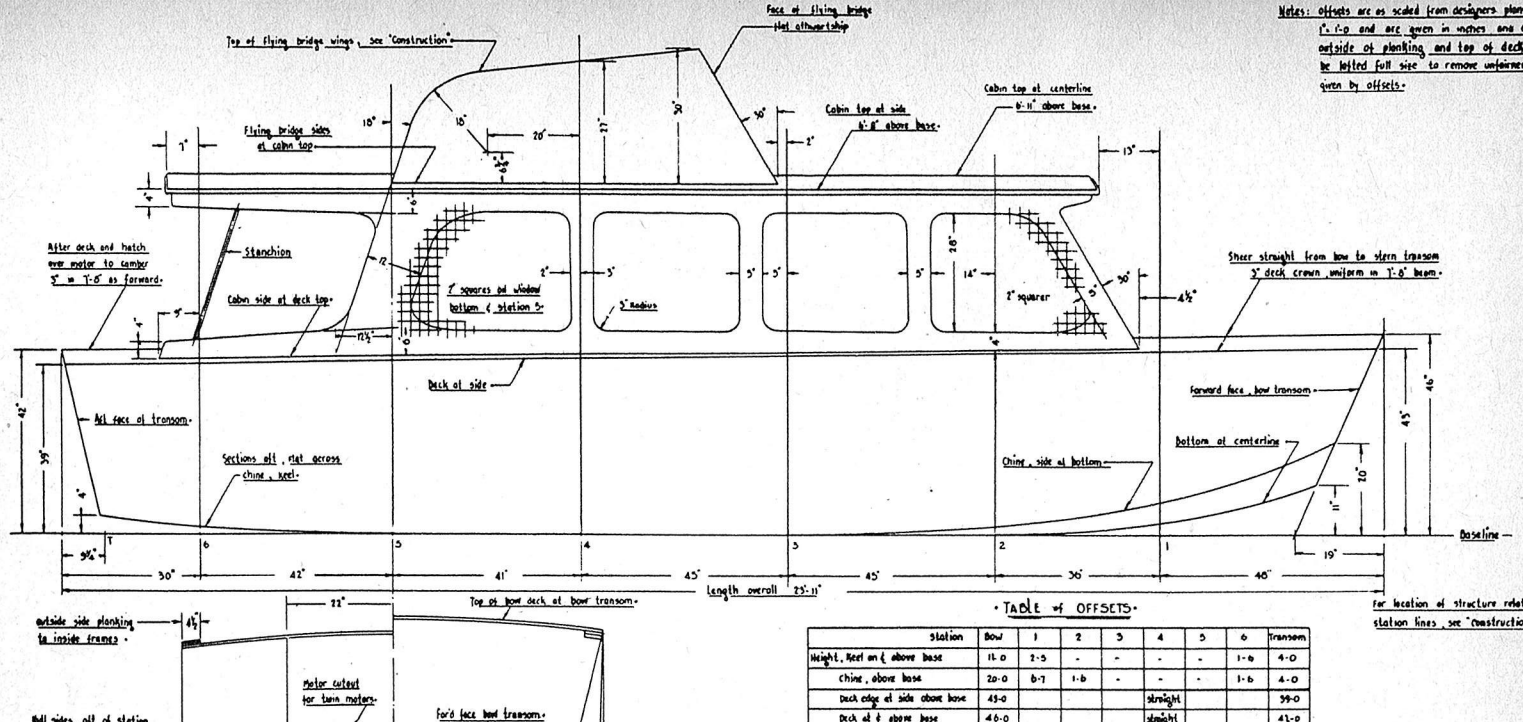


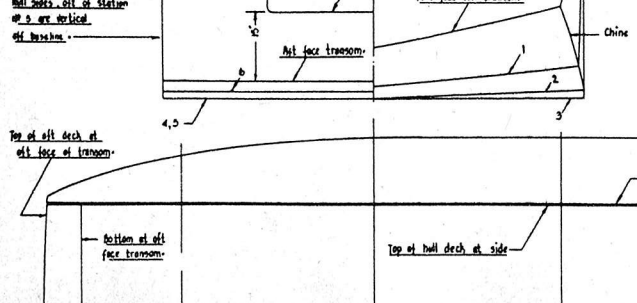
LARGE SCALE BLUEPRINTS will simplify construction. Send $15.00 to Twenty Boats Plans Dept., The Rudder Pub. Co., 9 Murray St., New York 7, N. Y. Specify Plan FB-362 Bayou Belle.


Construction details shown on this plan and on the sections are in accordance with accepted practices for plywood planked and framed boats. Builders are directed to standard texts on boat construction, Steward's "Small boat construction" or "Boat Building" by Chappelle, both available from Book Department, The Rudder, 9 Murray St. New York City 7, New York.
Motor differential controls for dual control installation manufactured by Morse Instrument Co. Hudson, Ohio.
Locate remote clutch and throttle controls on steering station side to suit.
Run bridge station motor controls in large radius curves to insure easy control action. Fit spray and rain proof cover over steering pulleys, located about as shown.
Bridge dash panel of ¾ by 10" mahogany to be at angle to suit steerer chosen and to provide ample knee room.
Cabin top ⅜" exterior grade fir plywood on ¾" x 2½" spruce, mahogany frames. Cover with No 10 canvas or resin-fiberglass.
Cowl ventilators on cabin top set on leveling blocks & cabin doublers.
Across hatch to bridge deck open.
20 ga. Monel water tank beneath seat
Carry 1" mahogany half round molding across on inclined 1" beam at for'd cabin end.
Cabin extension over cockpit. 1" o.d. by .060" thick chromed brass tubing in swaged end connections.
sliding
sliding
fixed
See "Construction Sections" for details on forward window.
Morse Instrument Co. Dual control differential units on suitable brackets.
Algonac wheel 18" dia. fig. H-100 A.
Mahogany toe-rail of 1½" square, beveled as indicated, across stem, 2½" No 12 flat head wood screws, spaced 6" to frame.
Connect motor and steering controls as directed by manufacturer.
Make motor well watertight, self-bailing, ⅜" plywd flat on stiffener.
drains
Fit eye-snaps in steering lines to connect-disconnect steering leads to one station as friction reduction.
open locker door
drawer
Shelf to suit
Stowage
½" bilge drain from ice tray.
locker
Seat Algonac fig. 1612
Locate Algonac H-100 step to suit
1" pipe
stretch top
locker
Cooks.
½" thk. berth side sheathing on frames, varnished to suit
Forward transom of ¾" DFPA "EXT" fir marine plywood, glued and 1½" No 10 f.h.w.s. fastened to framing, spaced 3½", staggered.
8" x 30" stowage opening
chine
1¼" x 5" oak keel
⅜" plywood double gussets on keel sides and doubling strips on transom, frame.
Ice box, galley and toilet space out board drains to be Perko fig. 0.6 on 5" x 5" mall doubler block, rubber hose connected.
To minimize steering loading at wheel, all pulleys should be roller, ball or needle bearing equipped, minimum diameter 2".
bottom double ⅜" 3 ply fir plywood, fiberglass cloth and resin laid between inner and outer layers.
· Construction Profile ·
Notch longitudinals into transom framing.
Side frames 1" by 3½" notched over chine and sheer stringers
line of side deck at edge
Side planking ½" fir plywood DFPA-EXT grade, 1¼" No 10 flat head wood screws spaced 3" into frames, chine, sheer.
½" bolts.
double ⅜" dia carriage bolts thru lapped side, bottom frames
chine 1¼" by 3½" yellow pine or oak, laminated or steamed ends
long'l battens on bottom & top of frames double gusseted with ⅜" fir plywood to make box girder
Upper frame battens 1¼" by ¾" to follow line of bottom.
Cut bow transom from single panel 36" x 46" x ¾" thick 5-ply DFPA-EXT fir plywood, glued and No 10 f.h.w.s. 1½" long into frames
transom planking ¾" fir plywood glued, screwed to framing 1½" No 10's
1½" by 4" oak transom stiffnr.
single ¼" bolt thru keel and frame.
Keel 1¼" by 5" fir, oak, or yellow pine, beveled for planking
· Bottom Const. Plan ·
Motor hatch ¾" by 1½" beams, heads
½" by 4" coaming on 22" by 24" hatch
½" by 3" mahogany trim piece on berth stowage plywd panel
notch ¾" by 3" for king plank into fore-deck beams and bow transom framing
¾" x 6" block for vent'l'r
cabin top beams & headers ¾" by 2½", notched for single 1½" No 8 f.h.w.s. each connection, top ⅜" fir plyw'd.
toilet compartment door 24" clear opening ⅜" rabbeted plyw'd. Offset hinges, Perko fig. 112, Wimlock, sim. to Perko 1057 to suit
Mahogany faced plywood ⅜" thick for interior counter and locker joiner bulkheads.
locker for dining table.
berth beams ¾" by 1¾"
¾" by 2" fir deck batten, as king plank, 1½" No 8 screws.
full ¾" by 6" coaming on inside sheer stringer
¾" by 3" block for cleat
cleat block
Fit 1½" thick blocking between sheer outer clamp and header, ⅜" bolting as indicated, fore & aft.
Side deck edge battens 1½" by 2½" oak, thru bolted ⅜" as indicated. Strips ¾" by 2¾" fir edge fastened thru ¾" x 2½" blocks.
1½" blocking 12" long midway between frames, two bolts ¼" diameter thru stringer, sheer.
· Deck Construction Plan ·


Section forward Fr N° 5
looking aft.
Section for'd Fr. no. 4
looking aft.
Section aft Frame No. 1
looking forward.
Section aft bow transom
looking forward.
Section aft Frame N° 2
looking forward.
Section for'd transom
looking aft.
Section for'd Fr. 6
looking aft.
fit centerline knee of 1" mahogany on vertical panel stiffener ¾" by 2" on ¾" plywood face.
locate throttle controls on block to suit, steerer pulleys machine screw fastened thru ¾6" sides.
dash panel cut as on "Outb'd Plan" of ¾" mahogany, to cleats on bridge sides, fasten with #10 oval head screws, chromed.
fresh water fill pipe 1½" i.p.s. elbow with pipe cap, or to suit
10" by 15" by 24" two baffle water tank, soldered-riveted 20 ga. Monel
fit solid chocks from 1" by 3" for for tank.
secure water pipe to beams with tubing straps, brass manhattan fig. K-404
¾6" flare tee from tank to galley "head" sinks.
medicine cabinet
cabin side ¾6" fir plywd rabbeted for double channel backing trim to suit, as on "Const.
galley sink, 10" by 10" by 6" depth, with strainer plug
copper tubing from f.w. tank to spring-closing faucet.
optional hinged side deck of ½" plywd stiffened
tilting sink in toilet, perko fig. 1550
edge molding.
sheer & inner clamp 1" by 3" double fastened 2" no. 12 screws to head of side frames.
butt hinge.
bolted angle clip on braces, s/s'd 10"
overboard drain to suit s/p of sink connection
shelving to suit, on cleats
folding panel
thru-hull fitting on plywd doubler, Perko fig. 84
Chine, double fastened 2½" no. 12 f.h.w.s to foot of side frames.
cut timber & ventilation holes in ¾" plywood gussets, end cleated between battens each side of frame
topside steering seat back, seat ¾6 plywd.
Cabin top optionally fiberglass covered
seat structure, stiffeners as on "Const. Plan" of ¾6" plywd, ¾6" by 1¾" cleats.
bath-thru seat back
full length handrails shaped from 1¾" square. 2½" no. 10 screws each beam.
radio or stowage shelf, door locker, trim ledge molding?
bathroom fixtures; towel rods, tissue holders, soap dish, glass & brush holders to be E.J. Willis figs. R-9240, R-9250, R-9260, R-9262 located to suit
16" by 23" screened opening in door 10" by 24", fit glass panel on turns Perko fig. 948-2 chromed.
hanging locker rabbeted door
rim lock, Perko 1046
fabricate door with solid frame ¾"-¾6" plywd panel to suit
frame head blocking between sheer clamp, stringer ¾" bolted, as on "const.
fabricate magazine rack to suit preferred reading
offset hinges
½" side planking, glued screwed 1½" no 10 screws spaced 4" countersunk.
fit ample sheer and quarter guard rails of shaped 2" by 3" stock, thru bolted if boat will be used in narrow locks and canals, metal moldings.
all structure, planking, decking shall be glue & screw fastened with no flexible compounds.
double bottom inner ¼" plywood fastened 1" no 8 spaced 6". Outer ¼6" laminations 1½" no 8, spaced 4".
Side decks, as on "Construction Plan" assembled as removable unit if boat is to be trailed. Thru bolted ¾" as shown.
Plywood decking ¾6" thick exterior grade fir center seamed. Glue and screw fasten to beams and longitudinals 1¾" no 10 screws, spaced 3½"
¾6" by 2" batten. ¼" corr. bolts
Bow transom framing 1⅝" oak or yellow pine, half lapped at chine verticals, sheer
Bow transom planking ¾6" s ply plywd.
fit 2½" wedge on slanted side planking to provide vertical batting surface for side decks.
¾" by 1¼" oak batten at chine at bottom planking edge - 2" no 10 screws into chine, spaced 8".
¾" by 1½" cleat on transom for ¾6" plywood berth bottom.
5" mattress, upholstered to suit.
¾6" by 1¾" beams
angle brackets bolted to 1½" by 2" oak clamp
bottom framing thru-out 1" oak, minimum depth 4½"
floor cleat ¾"x1½"
bottom frame single width deep plank
½" by 3" trim at berth cutout, fit optional cleat for filler cushion.
¾" fir plywood cabin top, center seamed on ¾6"x.5" king plank notched into ¾" by 2½" cabin beams, 1" no 8 screws, spaced 3½"
Upper side ledge piece 1¼" by 2⅞" on cabin side, notched for half-landing of beams
Cabin sides ¾6" fir or mahogany faced plywood, exterior or marine grade, 1⅛" no 10 screws into cabin corner frames, staggered 5"
fit suitable ledge moulding on steering stand & lockers
Perko fig. no 87 windshield adjusters 9" long chromed, 2 sets.
1⅛" by 2½" oak or mahog post.
¾" by 6" mahog. coaming
¾6 mahog. plywood.
Locate pulleys on rods, bearing type
fit two drawers 7" by 21" by 30"
hinged ½" plywd panel 19" wide on 4 Perko hinges, fig. 952-3", on cleat, to hinge down to make double berth. fit ledge on roller section with hook to suit.
Cabin decking ½" fir plywd on battens, seamed to suit material, 1¼" no 8 screws, spaced 6" into battens
bottom frame from 1" by 3" (dressed) oak or mahogany, notched for battens
stand roll-bed casters, commercial on ¾6" plywood frame, ¾" by 2⅛" stiffeners and corner posts.
Side coaming, cabin side extension as on "Lines."
fabricate light metal cover over Morse control units, drill holes for cables.
cockpit coaming piece mahog. ½" by 4", 1½" oval h'd screws.
hatch
otter deck hardware as on "Outb'd Plan". Decks, cabin top optionally covered with fiberglass cloth.
¾6" plywd bhd fran to fr. 6
transom planking, framing as for bow, above
lower transom frame lapped joint solid below motor cutout
fit access hatch in motor bulk head ¾6" plywd on forward side of lapped frame, 1⅛" no 8 screws.
gas tank stowage under seats port, s/b'd seats to suit tanks.
hatch into frames, full depth for ends of battens, double gusseted ¼" plywood, cleated
full length box girders, as on "Const. Plan", 1" no 8 screws thru plywood, glued, screws spaced 4"

Notes: offsets are as scaled from designers plans to scale of 1"=1'-0" and are given in inches and eighths to the outside of planking and top of deck. Ties etc should be lofted full size to remove unfairness, if any, as given by offsets.



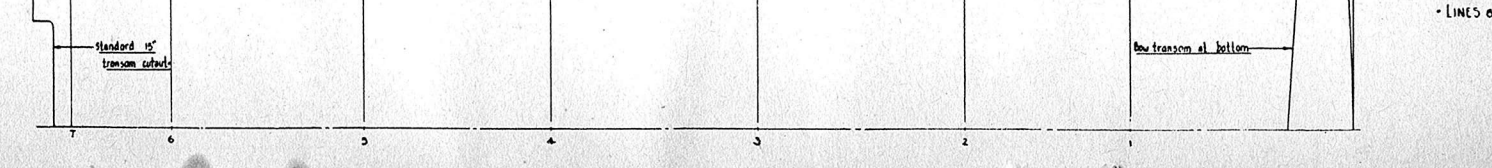


• TABLE of OFFSETS •

Station	Bow	1	2	3	4	5	6	Transom
Height, Keel on ℄ above base	11-0	2-5	-	-	-	-	1-6	4-0
Chine, above base	20-0	6-7	1-6	-	-	-	1-6	4-0
Deck edge at side above base	43-0				straight			39-0
Deck at ℄ above base	46-0				straight			41-0
Beam, chine from ℄	40-4	44-6	46-0		straight			46-0
Deck edge at side from ℄	46-0				straight			46-0
side platforms from ℄	48-0	59-0	60-0	61-0	61-0	61-0	58-2	48-0

• see "Notes" above •

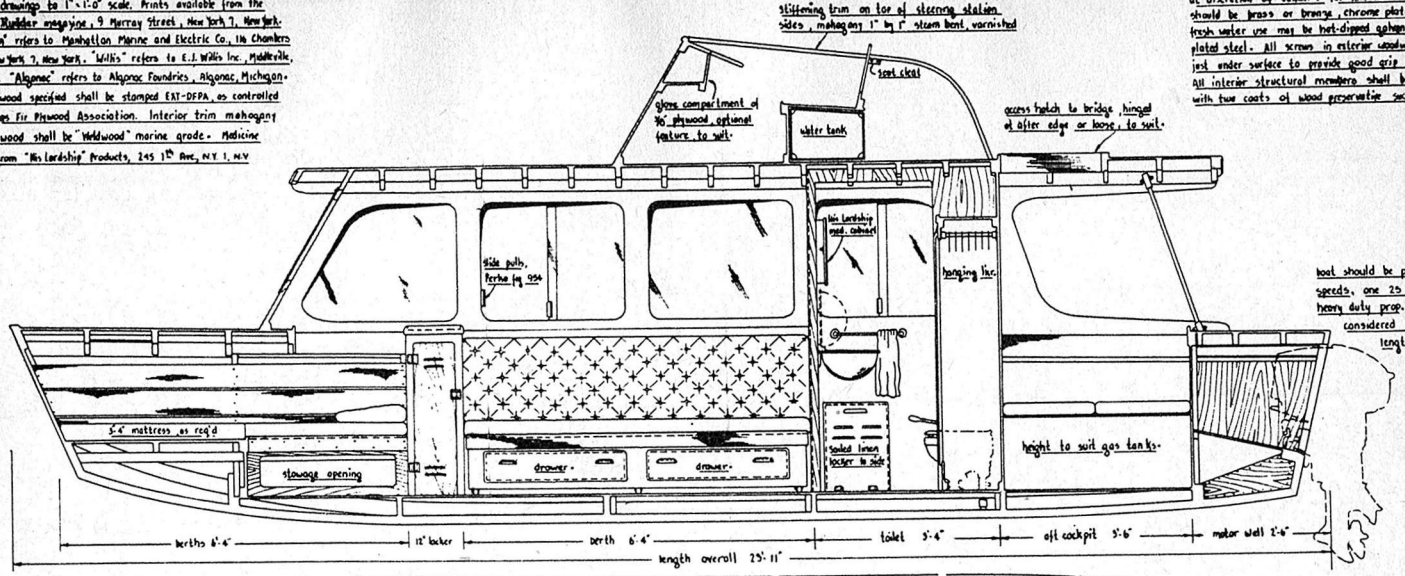
For location of structure relative to station lines, see "Construction Plan".



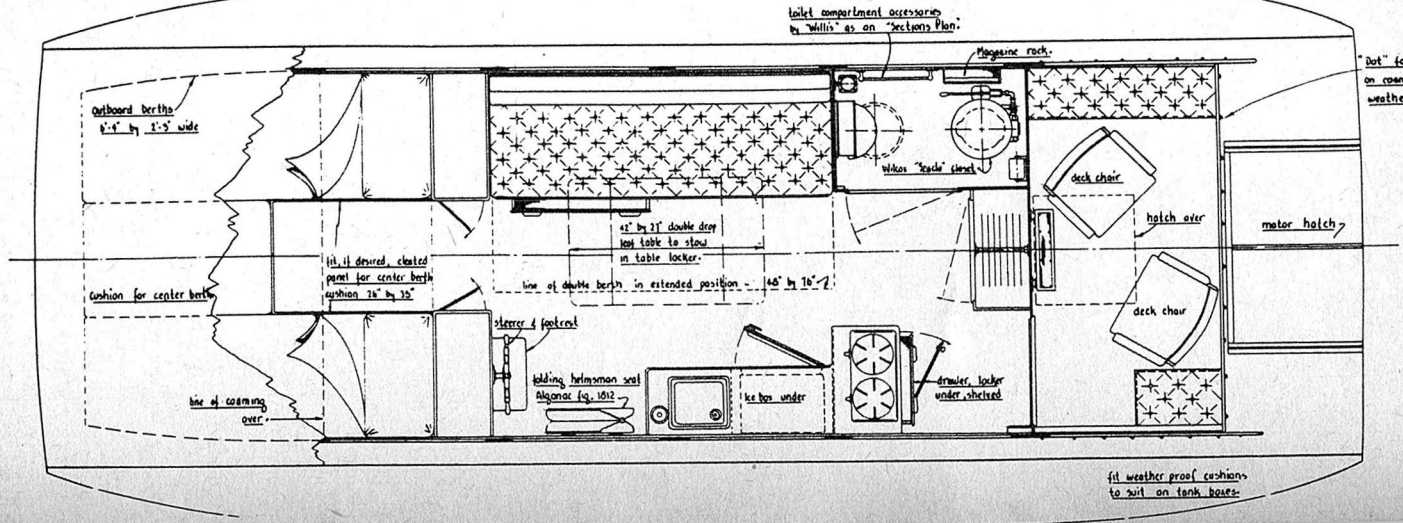
• LINES & OFFSETS •

The builder is advised to obtain large scale blueprints, made from designers drawings to 1"=1'-0" scale. Prints available from the publisher. "Rudder magazine, 9 Murray Street, New York 7, New York. "Manhattan" refers to Manhattan Marine and Electric Co., 116 Chambers Street, New York 7, New York. "Willis" refers to E.J. Willis Inc., Middleville, New York. "Algonac" refers to Algonac Foundries, Algonac, Michigan. All fir plywood specified shall be stamped EXT-DFPA, as controlled by Douglas Fir Plywood Association. Interior trim mahogany faced plywood shall be "Weldwood" marine grade. Medicine cabinet from "His Lordship" Products, 245 11th Ave, N.Y. 1, N.Y.

In general, catalog items given on this and other drawings have equivalents of other manufacturers. Substitutions are at discretion of builder. For salt water use, all hardware should be brass or bronze, chrome plated. Fastenings for fresh water use may be hot-dipped galvanized or cadmium plated steel. All screws in exterior woodwork shall be set just under surface to provide good grip for surfacing putty. All interior structural members shall be painted (brush coat) with two coats of wood preservative such as Copper naphthenate.

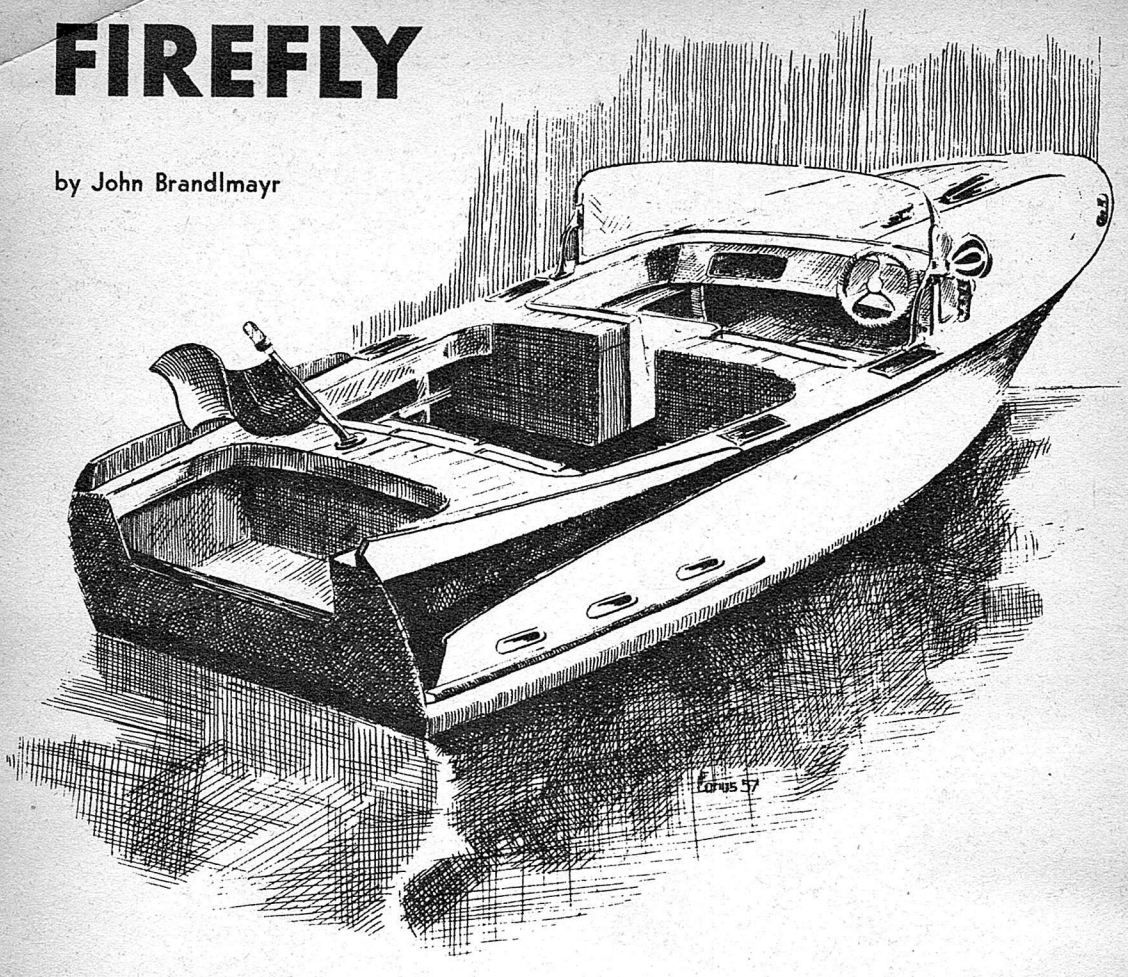


boat should be powered for modest speeds, one 25 h.p engine with heavy duty prop. or two 15 h.p engines considered maximum, standard length lower units is.



FIREFLY

by John Brandlmayr



Speed, stability and portability with room for five—that's the promise of this versatile plywood and Fiberglas 14-footer.

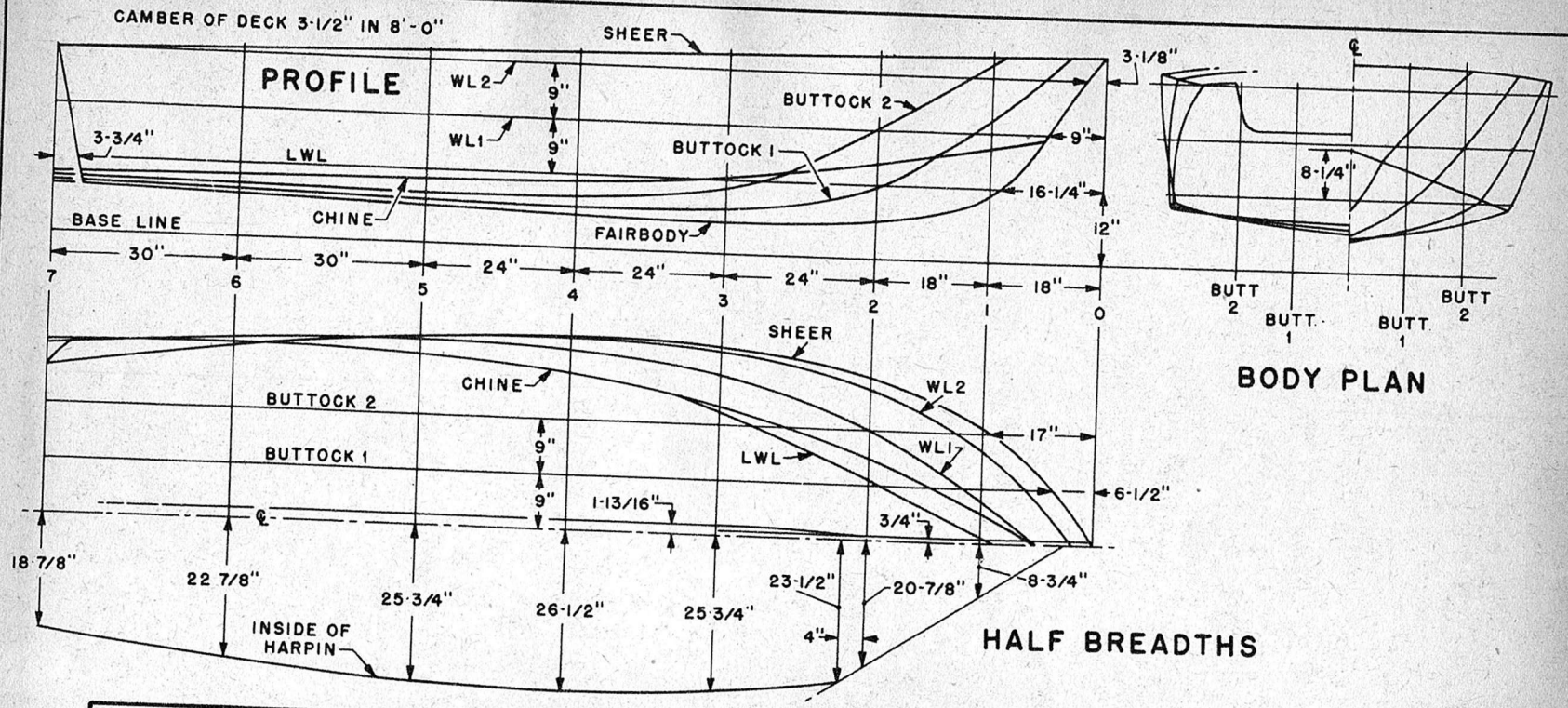
THIS is a highly versatile craft. She is the ideal trailer size, light enough so that there are no handling difficulties, but able enough for a day's enjoyment in most waters. Stability is such that passengers can stand and walk about without concern and she will carry five persons. Firefly makes an adequate and handy fishing boat for anything except offshore work.

SPEED

Of considerable importance is the exhilarating performance attainable with engines of 30 to 40 horsepower. Speeds in excess of 30 miles an hour can be reached with safe banked turns. Firefly has the speed and lifting ability for water skiing.

Construction methods shown are well suited for a home builder or for a small shop. The straight sheer facilitates the use of a solid sawed harpin. Such a harpin contributes to ease of alignment and insures a smooth, accurate curve at the sheer. Longitudinal hull battens are laid on the outside of the frames rather than notching the frames for the battens. This is done both for ease of construction and to give a uniform pattern of deflection to the plywood under load.

It will be noted that the batten nearest the chine log is spaced only one half as far away as the other battens are from each



HEIGHTS (ABOVE BASE LINE)								
STATION	0	1	2	3	4	5	6	7
SHEER	2-9-7		STRAIGHT RAKE TO →					
BUTTOCK 2		2-8-2	1-9-3	0-10-6	0-8-5	0-8-3		2-6-0
BUTTOCK 1		1-11-1	0-11-5	0-7-2	0-6-6 1/2	0-7-1 1/2	-STRAIGHT-	0-9-1/2
CHINE		1-6-5	1-3-4	1-0-4	0-11-0	0-10-4	-STRAIGHT-	0-8-3
FAIRBODY		0-10-5	0-6-1	0-5-1 1/2	0-5-4 1/2	— STRAIGHT —		0-7-7

HALF BREADTHS (FROM CENTER LINE)								
SHEER		1-6-5	2-2-3	2-6-5	2-7-4	2-6-6	2-4-2	2-0-0
W.L. 2		1-3-0	2-0-4	2-5-7	2-7-2	2-6-7	2-4-4	2-0-0
W.L. 1		0-6-6	1-5-7	2-1-7	2-5-2	2-6-1	2-5-4	2-3-6
L.W.L.		0-0-7	0-9-6	1-8-0				
CHINE		0-4-5	1-1-2	1-8-7	2-1-3 1/2	2-3-6	2-4-6	2-4-2

TABLE OF OFFSETS

NOTE: OFFSETS ARE GIVEN IN FEET, INCHES, AND EIGHTHS OF INCHES TO THE OUTSIDE EDGE OF PLANKING.

— PLANS BY PAUL PLEGAN —

other. This is to minimize deflections at the edge of the plywood sheet and thereby minimize the chance of the plywood working loose and developing a leak.

LOFTING

Lofting or laying down the lines merely consists of drawing the lines full size by referring to the lines drawing and the table of offsets. Smoothly faired curves should be drawn through the measured points and any discrepancies in the offsets should be faired into smooth curves. The only straight lines are the sheer in profile, the transom which slopes 12 degrees to the waterline and the after portions of the chine, buttocks and fairbody. The fairbody, which is parallel to the keelson, is a straight line from the stem to the transom and it is extremely important to the planing performance that this be a straight line on the finished hull.

At this stage the builder should decide whether he prefers the boat with or without fins. The fins shown are restrained and blend with the character of the boat. Small fins have no discernible effect on performance so they can be considered strictly a matter of personal choice.

To find the outline of component members it is necessary to deduct the thickness of the ¼-inch plywood. Notice that the harpin is located ¼ inch below the sheer line to allow for the thickness of the decking. The ¼-inch deduction must be made on the harpin, stem, transom, chines, keelson, deck members and on frames 1 and 2. On frames 3, 4, 5, and 6 a ¼-inch deduction for plywood and a further ¾ inch for the battens is made. Battens are not notched into these frames.

FRAMES AND HARPIN

Any light wood can be used for the harpin including cedar, sitka spruce or mahogany. The frames are sized for light woods such as mahogany or yellow cedar and if oak is used a reduction in molded width of ½ inch should be made. The floors are of solid stock, glued and bolted with ¼-inch carriage bolts. The chine joint is made with ⅜-inch plywood gussets on each side glued to the frames and fastened with ¼-inch carriage bolts. Sheer gussets or knees are of the same material as the frames. The tops of the frames are cut to fit the underside of the harpin.

STEM

Fir, mahogany or oak strips, sawn accurately to $\frac{3}{16}$ inch thickness, coated with a cold setting resorcinol glue can be bent to the required shape and clamped at six inch intervals to produce a laminated stem. It is particularly important to apply sufficient heat to properly cure the glue lines. A rabbet is not used in plywood construction since it reduces the effective bearing area of the plywood edge.

The transom is cut from ½ inch marine plywood—either mahogany or fir.

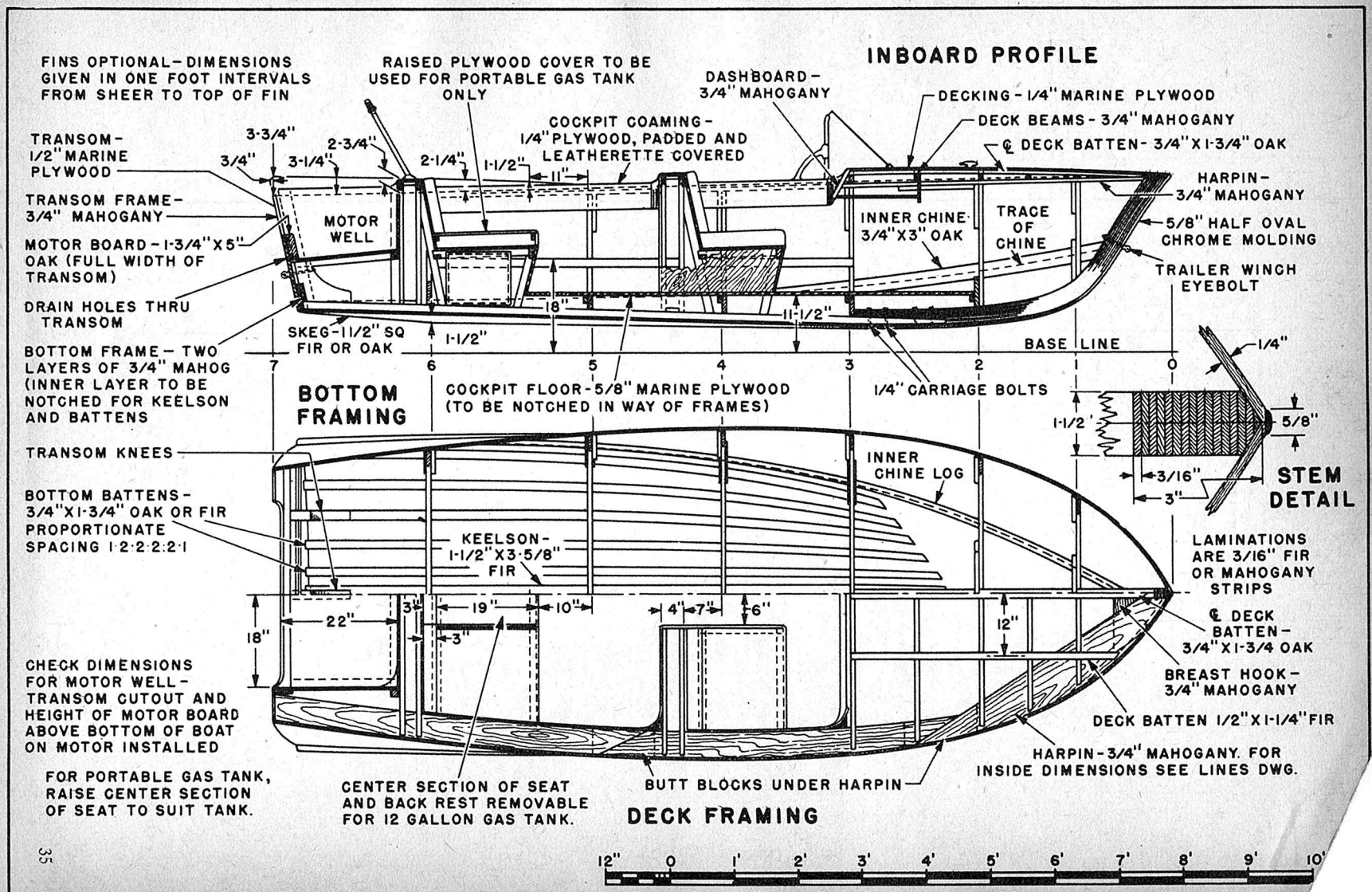
It is advisable to study the framing members and the construction of the watertight outboard well rather carefully and to install the hard to reach members first. Although a watertight motor well involves additional work it is important to the seaworthiness of a highly powered 14-foot runabout. This size of boat should have a short shaft engine to keep the center of gravity down but the deep transom cut-out introduces the possibility of swamping in a steep chop. A watertight motor well solves that problem. It also strengthens the transom and provides a handy spot for a battery and tools when working on the engine.

The transom side frame is of ¾-inch stock notched for the battens. The bottom frame is of double ¾-inch stock with only the forward thickness notched for the chine logs, battens and keelson. A 1¾-inch by 5-inch oak or fir motor board is notched around the side frames at its ends. Note that the motor well deck is fastened to the transom motor board before the transom is erected on the harpin.

SETTING UP

The hull is built upside down. A building base of scrap lumber should be assembled 12 to 18 inches above the workshop floor level. This base, consisting of six or seven 2 inch by 3 inch or 2 inch by 4 inch members, 5 or 6 feet long, laid out at about 2 feet on center, should be perfectly level. The harpin components are tacked to the base in their proper relationship, but upside down. Frames, transom and stem are all set up and temporarily braced into position and held by the fir keelson which is 1½ inches by 3⅝ inches. The keelson is glued to these members and fastened with four ¼-inch carriage bolts to the stem and two 2-inch No. 10 flathead screws to each frame and transom. These screws are countersunk ⅜ of an inch. Alignment of the frames should be checked and slight errors in beveling faired out.

Inner chine logs of select ¾-inch by 3-inch white oak are next bent into place, glued and fastened with two 1½-inch No.


INBOARD PROFILE
FINS OPTIONAL – DIMENSIONS GIVEN IN ONE FOOT INTERVALS FROM SHEER TO TOP OF FIN
RAISED PLYWOOD COVER TO BE USED FOR PORTABLE GAS TANK ONLY
DASHBOARD – 3/4" MAHOGANY
DECKING – 1/4" MARINE PLYWOOD
DECK BEAMS – 3/4" MAHOGANY
℄ DECK BATTEN – 3/4" X 1-3/4" OAK
COCKPIT COAMING – 1/4" PLYWOOD, PADDED AND LEATHERETTE COVERED
TRANSOM – 1/2" MARINE PLYWOOD
TRANSOM FRAME – 3/4" MAHOGANY
MOTOR BOARD – 1-3/4" X 5" OAK (FULL WIDTH OF TRANSOM)
DRAIN HOLES THRU TRANSOM
BOTTOM FRAME – TWO LAYERS OF 3/4" MAHOG (INNER LAYER TO BE NOTCHED FOR KEELSON AND BATTENS
3-3/4"
3/4"
3-1/4"
2-3/4"
2-1/4"
1-1/2"
11"
MOTOR WELL
INNER CHINE 3/4" X 3" OAK
TRACE OF CHINE
HARPIN – 3/4" MAHOGANY
5/8" HALF OVAL CHROME MOLDING
TRAILER WINCH EYEBOLT
18"
11-1/2"
SKEG – 1-1/2" SQ FIR OR OAK
1-1/2"
BASE LINE
7
6
5
4
3
2
0
BOTTOM FRAMING
COCKPIT FLOOR – 5/8" MARINE PLYWOOD (TO BE NOTCHED IN WAY OF FRAMES)
1/4" CARRIAGE BOLTS
1/4"
1-1/2"
5/8"
3/16"
3"
STEM DETAIL
TRANSOM KNEES
INNER CHINE LOG
BOTTOM BATTENS – 3/4" X 1-3/4" OAK OR FIR PROPORTIONATE SPACING 1·2·2·2·2·1
KEELSON – 1-1/2" X 3-5/8" FIR
LAMINATIONS ARE 3/16" FIR OR MAHOGANY STRIPS
22"
3"
19"
10"
4"
7"
6"
18"
3"
12"
℄ DECK BATTEN – 3/4" X 1-3/4 OAK
BREAST HOOK – 3/4" MAHOGANY
DECK BATTEN 1/2" X 1-1/4" FIR
HARPIN – 3/4" MAHOGANY. FOR INSIDE DIMENSIONS SEE LINES DWG.
CHECK DIMENSIONS FOR MOTOR WELL – TRANSOM CUTOUT AND HEIGHT OF MOTOR BOARD ABOVE BOTTOM OF BOAT ON MOTOR INSTALLED
FOR PORTABLE GAS TANK, RAISE CENTER SECTION OF SEAT TO SUIT TANK.
CENTER SECTION OF SEAT AND BACK REST REMOVABLE FOR 12 GALLON GAS TANK.
BUTT BLOCKS UNDER HARPIN
DECK FRAMING
12" 0 1' 2' 3' 4' 5' 6' 7' 8' 9' 10'

8 flathead screws pulled just below the surface of the wood. A hull that is out of alignment will give poor service.

At this stage alignment of the entire structure should be carefully checked and the battens temporarily laid into place to see that they fit fairly.

The battens of ¾-inch by 1¾-inch oak are glued and fastened with two 1½-inch No. 8 screws. As shown on the construction plan all battens terminate short of station 2 and the ends of the battens are tapered to $\frac{3}{16}$ inch thick over a length of one foot.

PLANKING

Before beginning the planking, make certain that all of the relatively inaccsessible components at the stern such as the triple knees and motor well deck are in place and fully fastened. Bevel chine logs, keelson and all of the other members to give a perfectly fair landing for the plywood planking.

First the topsides are covered with two sheets of ¼-inch by 24-inch by 15-feet full length marine plywood. Rough trimming is done before application and the plywood should be laid in Dolfinite seam compound. Work from amidships fore and aft, fastening with ⅞-inch No. 8 flathead screws spaced 4 inches on center on battens, 3 inches on center at chine and harpin and 2 inches on center at stem and transom. Drill a slight countersink to pull the screws just below the surface. Use socket head screws and an electric screwdriver. Butt the plywood at the stem.

Apply both sides of the boat at nearly the same time and do not leave the hull over a day with only one side planked as this will cause distortion.

Bevel the topside planking flush with the chine log to receive an overlap from the bottom extending from the transom to approximately station 3. From this point forward, trim the topside planking in a smooth line to the stem with the edge perpendicular to the chine log surface, in other words, square off the plywood edge over this length.

Bottom planking consisting of two sheets ¼ inch by 3 feet by 14 feet is applied similarly. Planking is butted at the keelson and stem. The screws are spaced at 4 inches on center on the battens and at 2 inches on center on the keel, chine logs, stem and transom. At all times take note of the wood grain before driving a series of screws. Bevel the plywood along the centerline for the keel and the stem molding.

FIBERGLASSING

Although this hull can be built without the Fiberglas finish the designer prefers to see it used on the bottom and topsides. It should be applied at this stage of construction before the keel or outer chine logs are fastened in position.

The oak keel is fastened with No. 10 screws staggered at 3 inches on center and of lengths as required.

The importance of the outer chine log in a planing hull cannot be over-emphasized. It acts as a spray deflector and the lower edge should be trimmed horizontal from the station forward of the transom to the forward sections where it is tapered off. Fasten the outer chine log with 1¼-inch No. 10 flathead screws spaced at 3 inches on center and staggered. The hull is now turned over and the planking trimmed flush with the harpin.

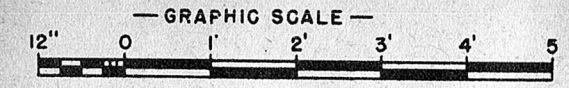
Deck beams are cut and fitted as shown. Fastenings to the harpin are two 2-inch No. 10 flathead screws at each beam.

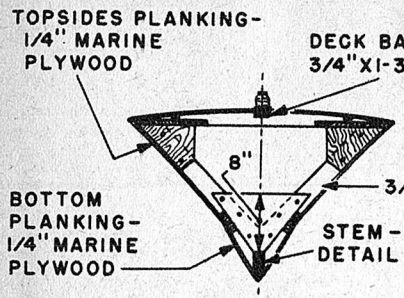
Decking can be of mahogany plywood finished bright in keeping with the style of the boat. Set the plywood in Dolfinite on the beams and fasten with ⅞-inch No. 8 oval head plated brass screws spaced at 2 inches on center around the sheer, 3 inches on center in the beams and other backing members.

TANKS

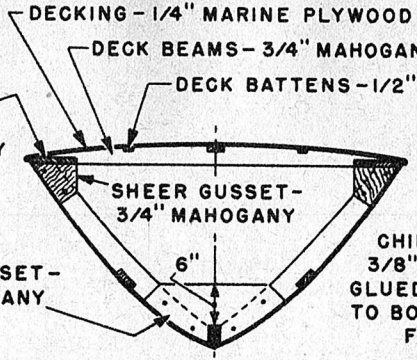
It is suggested that one 12-gallon permanent gasoline tank be installed as illustrated to reduce the fire hazard. Most outboard motors are alternatively equipped with a fuel pump. The tank should be securely chocked and properly vented. If a portable tank is preferred place the aft seat at the correct height to accommodate your particular tank.

A half-oval chrome molding can be used to advantage around the sheer and down the face of the stem. If possible use the molding with the slightly concave back to get neatest job. To dress up boat, designer suggests using a padded leatherette coaming and colored leatherette cushion seats. •

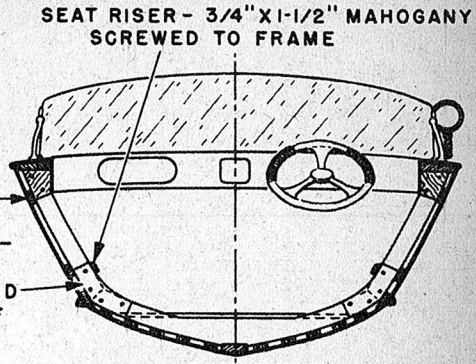




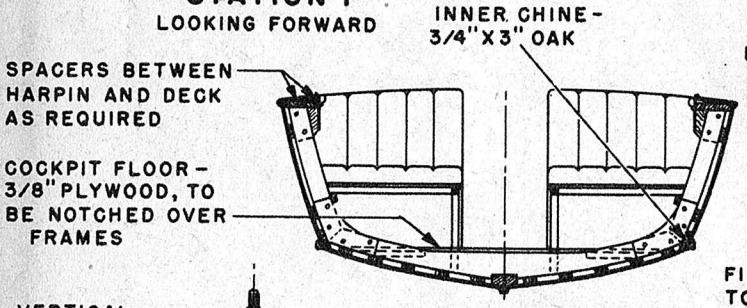
STATION 1
LOOKING FORWARD



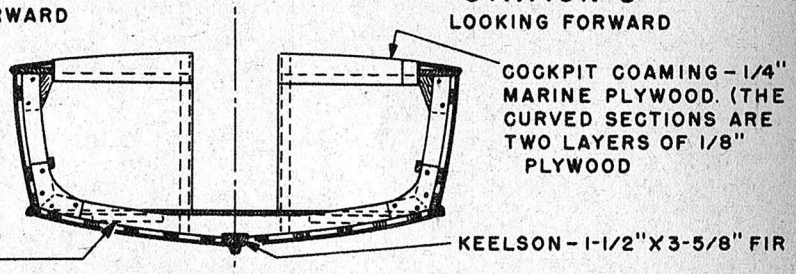
STATION 2
LOOKING FORWARD



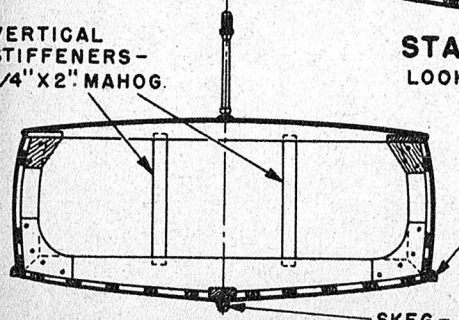
STATION 3
LOOKING FORWARD



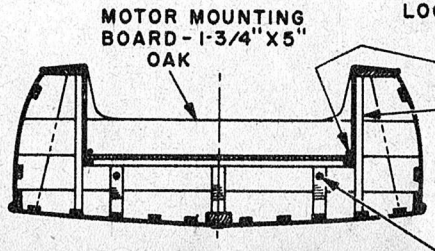
STATION 4
LOOKING AFT



STATION 5
LOOKING FORWARD



STATION 6
LOOKING AFT



TRANSOM
LOOKING AFT

NOTE IT IS IMPORTANT THAT THE LOWER SURFACE OF THE OUTER CHINE BE HORIZONTAL BACK TO STATION 6, THEN ROUNDED OFF AFT.

SHOVELLER

by Robert M. Steward

This 13-foot 8-inch duck boat is perfect for the man who is both hunter and amateur boat builder.

HERE is a duck boat that is reasonably easy to build. The frames are made from the full-size sections developed after the fore and aft lines have been laid down. The planking and decking thicknesses, ½ inch on the sides and ¼ inch elsewhere, must be deducted from the sections in order to have the frames of correct size, because the lines for small boats are drawn to the outside of the planking. Bevels on the side and bottom frames are picked up from full-size lines and sawed or planed on the frame material edges.

To keep weight at a minimum the frames, cockpit sides, the side frame and deck beam have been simply designed, each to be cut from a single piece. Intermediate bottom frames, between regular frames to support the floor boards, can be fitted after the bottom is planked.

The deck beams and the top edge of the transom are all sawed to radius of 6 feet 6 inches. Assemble the bottom and side frames, and the deck beams where required, with 1-inch No. 8 flathead screws and waterproof glue.

Make the transom with cheek pieces to take some of the side planking screws since the end grain of the cedar transom will not hold fastenings too well. Notch the transom for the keelson; allow enough material on the forward side for the edge bevels so the planking will bear correctly. The finished transom will be slightly larger inside the boat than it is outside. The transom knee, to take the thrust of an outboard motor, is shaped as shown and screwed or bolted to the transom.

Cut the stem from a piece of white oak or mahogany and rabbet for the ½-inch thick side planking. The stem rabbet will be of the same section throughout.

The side planks are to be of ½-inch thick white cedar and the upper edges are straight in accordance with the lines drawing (sheer). The chine edge can be marked out by tacking a long batten on the deck line of the full-size lines and marking each station and the stem rabbet on the batten. When the batten is lifted you will have the true length of the side plank. Lay the batten along the sheer edge of the side planks and transfer the station points. Draw station lines by squaring down from the sheer edge. Then measure on the sections the depth of the chine line below the sheer and transfer the measurements to the side planks. A batten faired through the points will enable the chine line to be drawn on the plank. Temporarily fasten the side planks together to cut the bottom edge, but don't saw closer than ⅜ inch of the line to allow for beveling later.

The boards for the keel should be prepared square edged, and the width of the bottom-planking overlap marked from each edge with a butt gauge. As the angle of deadrise of the bottom is constant, the amount of bevel for the planking rabbet can also be marked on the edges and the bevel planed. Pare off the keel edges forward to a neat fit between the side planks. This cut, too, can be made from the lines drawing. The bottom of the stem must be notched for the fore end of the keel.

Assemble the side planking, transom, stem and frames of this hull upside down on two or three carpenter's horses adjusted to keep the sheer edges of the side planks parallel. There is no twist in the sides so the forward edge of the planks can be cut to the stem rabbet angle from the full-size drawing. All seams that could admit water into the boat must be liberally coated with a sealer. The glue must go on the edges of the transom, in the stem rabbet, between keel and keelson, both edges of the side planks, on the batten for the decking seam on the centerline of the boat, etc. Apply it after the parts have been trial-fitted, before final assembly.

Start the assembly by fastening the side planks to the transom and the planking to the side frames. Use 1¼-inch No. 10 flathead screws for this. Countersink the heads slightly and putty them over later. Now one man can stand at the bow and pull the ends of the side planks together

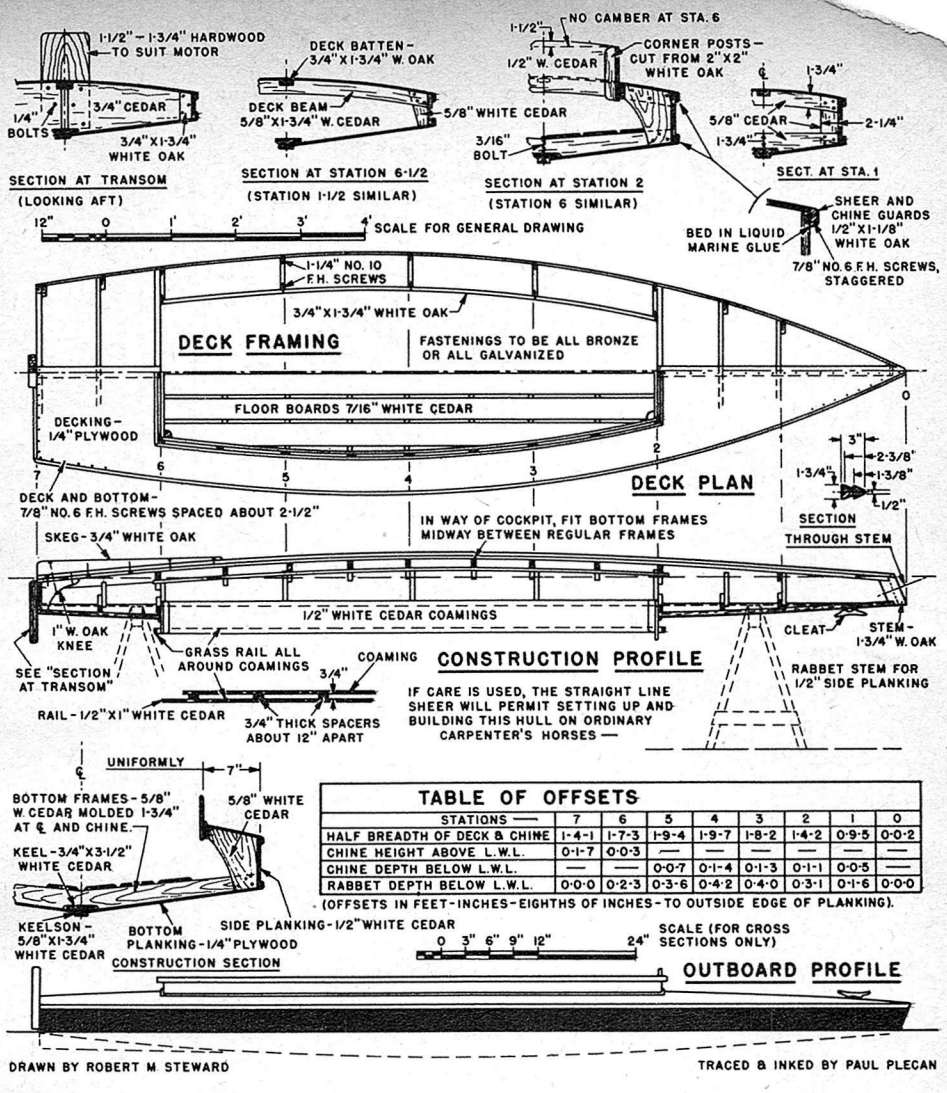


TABLE OF OFFSETS

STATIONS —	7	6	5	4	3	2	1	0
HALF BREADTH OF DECK & CHINE	1-4-1	1-7-3	1-9-4	1-9-7	1-8-2	1-4-2	0-9-5	0-0-2
CHINE HEIGHT ABOVE L.W.L.	0-1-7	0-0-3	—	—	—	—	—	—
CHINE DEPTH BELOW L.W.L.	—	—	0-0-7	0-1-4	0-1-3	0-1-1	0-0-5	—
RABBET DEPTH BELOW L.W.L.	0-0-0	0-2-3	0-3-6	0-4-2	0-4-0	0-3-1	0-1-6	0-0-0

(OFFSETS IN FEET-INCHES-EIGHTHS OF INCHES – TO OUTSIDE EDGE OF PLANKING).

as the other places the side frames, clamps them while alignment is checked, and then fastens each in turn, working from the transom toward the bow. The most difficult job will be making sure that the boat is not twisted. Do this by working in the keel at the same time. Fasten the keel in the transom notch with screws, then clamp it to the frames while lining up the hull. The keelson is added before the bottom is planked with one $\frac{3}{16}$-inch flathead bolt through the keelson, keel and frame at each station. Fit and fasten the skeg.

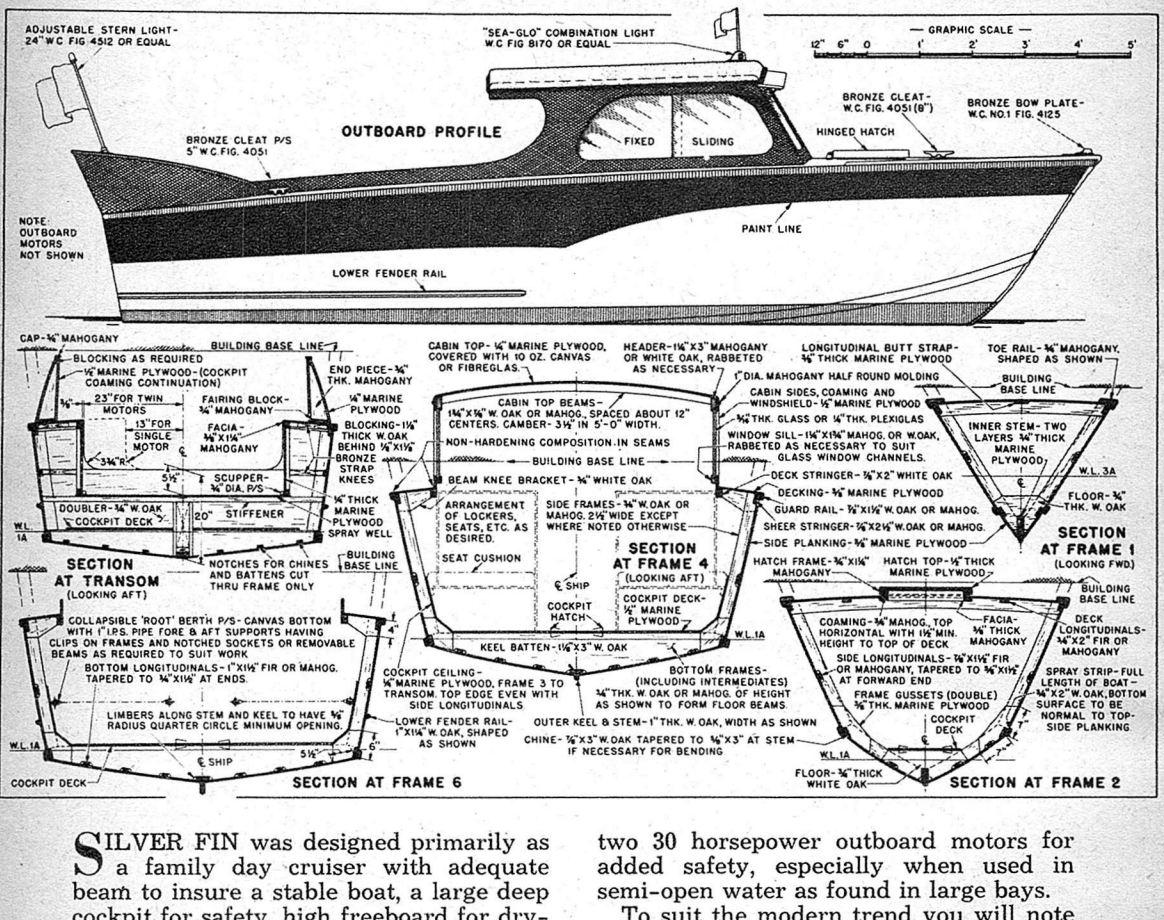
Prepare for bottom planking by placing one end of a straightedge in the rabbet formed by the keel and keelson and laying the edge across the side planks so the edge can be planed to correct bevel and to the chine line at the same time. The bottom planking, of ¼-inch waterproof fir plywood, is fastened to the rabbet, side planks, transom and frames with ⅞-inch No. 6 flathead screws. Drill carefully for the screws and countersink the heads for puttying. Space the screws not more than 2½ inches apart. If an outboard motor is to be used, fit a hardwood motor board as shown and bolt it through the transom.

Turn the boat over, paint the inside of the hull, install the cockpit header, centerline decking seam battens, then fit and fasten the decking same as the bottom. Add the intermediate bottom frames and floor boards, coamings and rails to hold grass, and the sheer and chine guard strips. Paint the boat "dead grass" or other favorite ducking color, but first coat the plywood with sealer or plywood primer. •

SILVER FIN

by A. Mason

This 20-foot day boat may be built of plywood and equipped with twin engines.



SILVER FIN was designed primarily as a family day cruiser with adequate beam to insure a stable boat, a large deep cockpit for safety, high freeboard for dryness in rough water and generous sheltered space for weather protection. With only a slight modification to include additional lockers for stowing a small amount of additional equipment, Silver Fin becomes a satisfactory camping cruiser for two, especially in tidewater areas where it is impractical to sleep ashore.

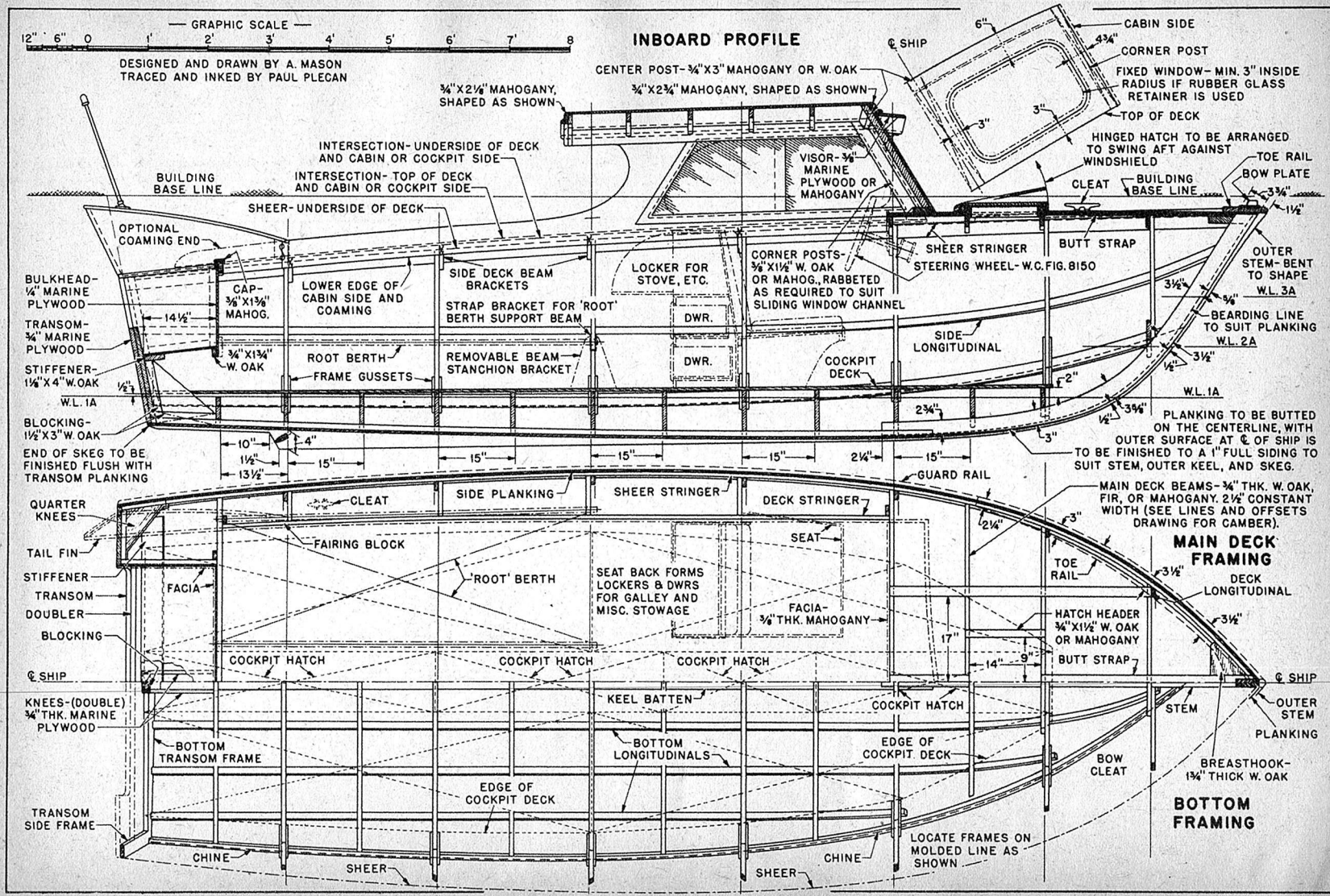
Silver Fin was deliberately designed with little detail to the interior due to many possibilities that only the ingenuity of the builder can develop. It might be suggested that the back of the driver's seat and the companion seat be fitted with lockers having doors that hinge down to form a cooking and working area as indicated on the construction plan.

While Silver Fin has been designed to be capable of speeds up to 30 miles an hour with outboards up to 60 horsepower, the transom cut-out has been laid out to suit two 30 horsepower outboard motors for added safety, especially when used in semi-open water as found in large bays.

To suit the modern trend you will note the two tail fins as seen on many late model cars and even smaller outboard boats, with an adjustable stern light mounted on one fin as shown. These optional tail fins are not structural members of the boat and their only purpose is to partially hide the motors in profile. Their omission will not affect Silver Fin's performance.

Although the kind of plywood is not specified on the plans, should mahogany plywood be used it is important that all the plies be mahogany, not just the two-face layers, as there have been many cases where the center cores that were not mahogany have dry-rotted away, leaving only a thin shell which eventually collapsed. Only the marine grade or equivalent quality of plywood should be used.

The construction of Silver Fin requires waterproof glue and screw fastenings to make proper contact between the surfaces.


— GRAPHIC SCALE —
12" 6" 0 1' 2' 3' 4' 5' 6' 7' 8
DESIGNED AND DRAWN BY A. MASON
TRACED AND INKED BY PAUL PLECAN
INBOARD PROFILE
CENTER POST- ¾"X3" MAHOGANY OR W. OAK
¾"X2⅛" MAHOGANY, SHAPED AS SHOWN
¾"X2¾" MAHOGANY, SHAPED AS SHOWN
℄ SHIP
6"
CABIN SIDE
4¾"
CORNER POST
FIXED WINDOW- MIN. 3" INSIDE RADIUS IF RUBBER GLASS RETAINER IS USED
TOP OF DECK
3"
3"
HINGED HATCH TO BE ARRANGED TO SWING AFT AGAINST WINDSHIELD
TOE RAIL
BOW PLATE
CLEAT
BUILDING BASE LINE
3¾"
1½"
INTERSECTION- UNDERSIDE OF DECK AND CABIN OR COCKPIT SIDE
INTERSECTION- TOP OF DECK AND CABIN OR COCKPIT SIDE
BUILDING BASE LINE
VISOR- ¾" MARINE PLYWOOD OR MAHOGANY
SHEER- UNDERSIDE OF DECK
OPTIONAL COAMING END
BULKHEAD- ¼" MARINE PLYWOOD
TRANSOM- ¾" MARINE PLYWOOD
STIFFENER- 1⅛"X4" W.OAK
BLOCKING- 1½"X3" W. OAK
END OF SKEG TO BE FINISHED FLUSH WITH TRANSOM PLANKING
CAP- ⅜"X1⅜" MAHOG.
¾"X1¾" W. OAK
14½"
LOWER EDGE OF CABIN SIDE AND COAMING
ROOT BERTH
FRAME GUSSETS
SIDE DECK BEAM BRACKETS
STRAP BRACKET FOR 'ROOT' BERTH SUPPORT BEAM
REMOVABLE BEAM STANCHION BRACKET
LOCKER FOR STOVE, ETC.
DWR.
DWR.
CORNER POSTS- ⅜"X1½" W. OAK OR MAHOG., RABBETED AS REQUIRED TO SUIT SLIDING WINDOW CHANNEL
SHEER STRINGER
STEERING WHEEL- W.C. FIG. 8150
BUTT STRAP
SIDE- LONGITUDINAL
COCKPIT DECK
OUTER STEM- BENT TO SHAPE
W.L. 3A
3½"
⅜"
BEARDING LINE TO SUIT PLANKING
W.L. 2A
3½"
½"
2"
W.L. 1A
2¾"
3⅝"
½"
3"
PLANKING TO BE BUTTED ON THE CENTERLINE, WITH OUTER SURFACE AT ℄ OF SHIP IS TO BE FINISHED TO A 1" FULL SIDING TO SUIT STEM, OUTER KEEL, AND SKEG.
10"
4"
1½"
15"
13½"
15"
15"
15"
2¼"
15"
GUARD RAIL
MAIN DECK BEAMS- ¾" THK. W. OAK, FIR, OR MAHOGANY. 2½" CONSTANT WIDTH (SEE LINES AND OFFSETS DRAWING FOR CAMBER).
MAIN DECK FRAMING
QUARTER KNEES
TAIL FIN
STIFFENER
TRANSOM
DOUBLER
BLOCKING
℄ SHIP
CLEAT
SIDE PLANKING
SHEER STRINGER
DECK STRINGER
FAIRING BLOCK
FACIA
'ROOT' BERTH
SEAT BACK FORMS LOCKERS & DWRS FOR GALLEY AND MISC. STOWAGE
SEAT
FACIA- ⅜" THK. MAHOGANY
2¼"
3"
TOE RAIL
3½"
DECK LONGITUDINAL
3½"
HATCH HEADER ¾"X1½" W. OAK OR MAHOGANY
17"
14"
9"
BUTT STRAP
COCKPIT HATCH
COCKPIT HATCH
COCKPIT HATCH
COCKPIT HATCH
KEEL BATTEN
KNEES- (DOUBLE) ¾" THK. MARINE PLYWOOD
BOTTOM TRANSOM FRAME
BOTTOM LONGITUDINALS
EDGE OF COCKPIT DECK
EDGE OF COCKPIT DECK
STEM
OUTER STEM
PLANKING
BOW CLEAT
BREASTHOOK- 1¾" THICK W. OAK
BOTTOM FRAMING
TRANSOM SIDE FRAME
CHINE
SHEER
SHEER
CHINE
LOCATE FRAMES ON MOLDED LINE AS SHOWN

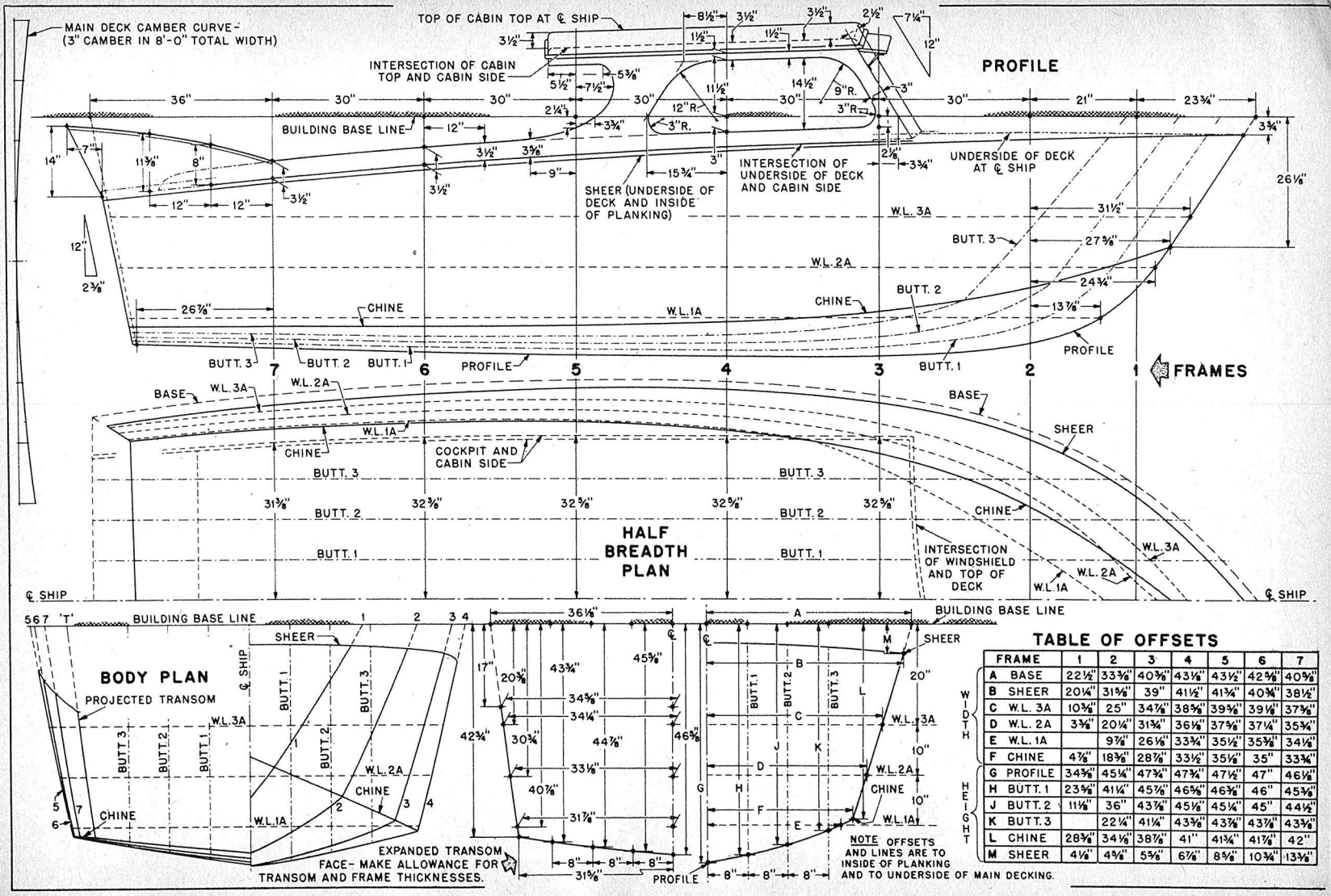


TABLE OF OFFSETS

	FRAME	1	2	3	4	5	6	7
WIDTH	A BASE	22⅛"	33½"	40⅜"	43⅛"	43½"	42⅝"	40⅜"
	B SHEER	20¼"	31⅜"	39"	41½"	41¾"	40¾"	38½"
	C W.L. 3A	10⅜"	25"	34⅞"	38⅜"	39⅜"	39⅛"	37⅜"
	D W.L. 2A	3⅜"	20¼"	31¾"	36⅛"	37⅜"	37¼"	35¾"
	E W.L. 1A		9⅞"	26½"	33¾"	35½"	35⅜"	34½"
	F CHINE	4⅞"	18⅜"	28⅞"	33½"	35⅛"	35"	33¾"
HEIGHT	G PROFILE	34⅜"	45¼"	47¾"	47¾"	47½"	47"	46½"
	H BUTT. 1	23⅝"	41¼"	45⅞"	46⅝"	46⅜"	46"	45⅜"
	J BUTT. 2	11½"	36"	43⅛"	45⅛"	45¼"	45"	44½"
	K BUTT. 3		22¼"	41¼"	43⅜"	43⅞"	43⅞"	43⅜"
	L CHINE	28⅜"	34⅛"	38⅞"	41"	41¾"	41⅞"	42"
	M SHEER	4½"	4⅝"	5⅜"	6⅞"	8⅜"	10¾"	13⅜"

NOTE OFFSETS AND LINES ARE TO INSIDE OF PLANKING AND TO UNDERSIDE OF MAIN DECKING.

Fastenings spaced sufficiently close together along the edges provide pressure to squeeze out the air from the pockets and insure tight faying surfaces. The manufacturer's instructions should be followed completely for the use of the glue.

Silver Fin should be built upside down. For that reason the offsets are all given to a base line located above the sheer and to the inside of planking and underside of decking. It is most advisable to lay down the lines of the boat full size. It is a lengthy operation, but is the only way to find slight errors in the hull form or clerical mistakes in the offsets that are not apparent to the eye when working on a small drawing. Plenty of time must be allowed for this portion of the work and the builder should construct the boat mentally as he lays out his full-size plans.

Each frame should be laid out for both sides instead of the usual procedure as each bottom frame is a single piece from chine to chine across the centerline of the boat. From these outlines templates can be made for marking off each part on a plank so that the grain runs as long as possible on the turns. Cut out these parts and smooth up the inner edges, but do not cut any notches or bevels until the frames are set up. After checking each part on the full-size frame layout, the frames are assembled; across the top add a temporary cross brace to hold the frame together.

On a clear level floor lay out the centerline and frame lines at the locations shown and finish up the transom. After checking each frame for symmetry all parts can be set up, taking care that the centerline of each frame lines up with the centerline on the floor and that the entire framework is thoroughly braced together and all parts lie fair and in proper relation to each other.

Bend the keel in place, locating it in the notches provided, and bolt it to each frame and the stem on the centerline with $\frac{5}{16}$-inch diameter carriage bolts. Then by using battens long enough to go over at least four frame spaces, the outer edges of the frames, keel and stem can be beveled. At the same time notch for stringers, clamp and chine logs. There is no rabbeting on the chine or clamp, which simplifies the work a good deal. These members together with the stringers can be added and fastened to the frames with long wood screws.

The entire frame should be carefully checked for bevels and fairness. See that all bolt and screw heads are recessed wherever necessary. The boat is now ready for planking the topsides. It is simpler to use a thin sheet of inexpensive plywood as a template, checked for a fit on both sides and then laid out on the good plywood. After cutting and fitting each side drive the alternate screws. When all has been satisfactorily done back out the screws, apply glue to all contact surfaces, replace the plank and redrive the screws as well as those previously omitted (this is the best method). Plane off the bottom edge flush with the chine log so the bottom planking fits close together along the edge.

The bottom planking can be done in a similar manner and the outer edge should be planed flush with the outer surface of the side planking. Then the spray strips, outer stem and outer keel can be fitted. Before finally fastening in place, bed these well in seam composition so that all recesses will be filled. All screw heads should be recessed slightly to allow for filler over the heads before painting.

The boat can now be removed from the floor, turned over, the frame projections cut off, and the deck beams, brackets, deck stringers and the various blocking fitted. The decking can be added in the same manner as the planking, and the guard rails, coamings, seat risers, floorboards, joinerwork and shelter added.

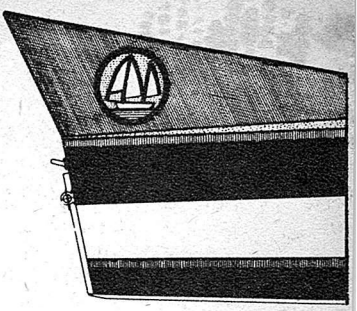
She is now ready for painting, which should be carefully done with the best materials in accordance with the manufacturer's recommendations. The surface to be painted must be smooth, dry and clean. At least two coats of plywood sealer should be applied before giving her at least three coats of paint or varnish.

If the materials specified are not available in your area see what the local practice has been and substitute accordingly. Watch the weight, however, and don't spoil things with the idea of improving the hull form or construction. Scantlings and proportions are about right and must be retained if maximum performance is desired.

Specify that all the wood listed is to be used for boat building and is to be air dried to a maximum of 15 per cent moisture content. All lumber should be free from checks, warps or wanes. Only tight knots not over ½ inch in diameter are to be permitted. All hardwood is to consist of first, second or select grades only. All softwood is to consist of A and B grades only. For salt-water use, bronze or Monel metal fastenings are recommended. For fresh water, hot-dipped galvanized steel fastenings are adequate. •

SQUALL

by A. Mason



Designed for the young-in-heart and built of plywood, this 14-foot runabout can attain speeds of almost 32 miles per hour.

SQUALL has all the features of a modern sport runabout, but being built of waterproof plywood sheets, the construction has been simplified to produce a lightweight strong hull suitable for many uses. Squall was designed to handle well at all speeds using any outboard motor from 10 to 30 horsepower. With a total crew weight of not over 225 pounds, a 10-hp motor is fully capable of driving Squall up to 18 miles per hour; 22-hp will do close to 27 miles, and a 30-hp motor is almost capable of 32 miles per hour. Of course, it is understood that the best propeller combination as recommended by the manufacturer and a thorough engine tune-up is a necessity to reach these speeds.

The modern trend is evident in the twin tail fins; their principal purpose is to partially hide the motor in profile view. However, if the feature does not appeal, simply omit the tail fins as they will have no effect on the performance, and while they do not add to the structural strength of the boat, they may aid in keeping the motor drier when running in a choppy sea.

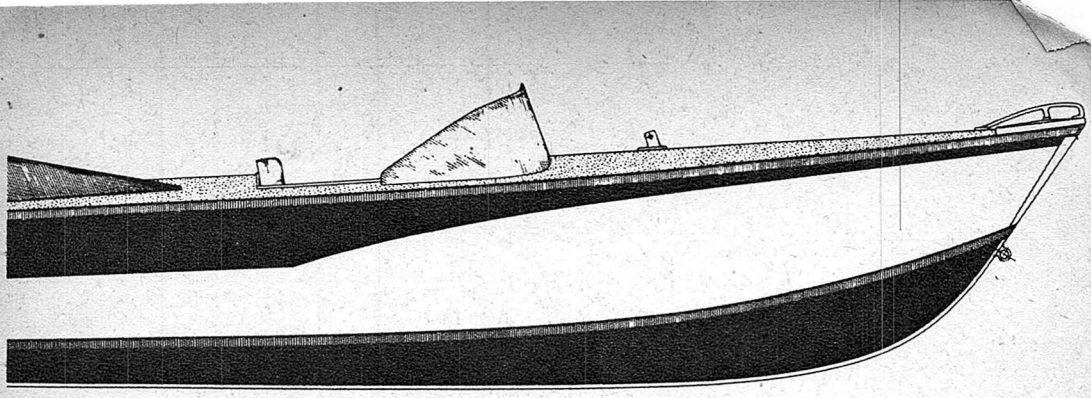
Before starting construction, study the plans. The sizes given are all for finished materials and almost any mill will recut rough stock to the final thicknesses or sizes. Incidentally, while the variety of marine plywood is not specified, if a nice job is desired, use marine mahogany plywood. In many boats built using only mahogany-faced plywood, the center core completely rotted out leaving only a thin shell that eventually collapsed. If solid mahogany is not available, Douglas fir plywood should be chosen in preference to using birch plywood. However, no matter what plywood is used, it should be marine grade or equivalent quality for marine use.

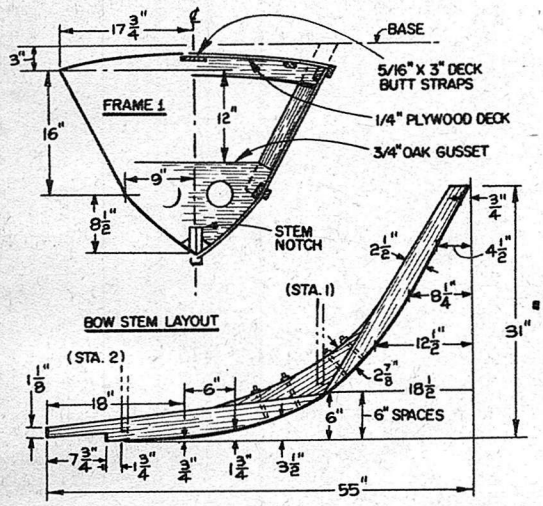
Since it is much more convenient to build Squall upside down, the lines and offsets are all given to a base line located above the sheer line and to the inside of planking and underside of decking. It is most advisable to lay down the lines of the boat full size, and while a clear floor space of sufficient size might be slightly difficult to secure, careful lofting is still the foundation of good workmanship in building any boat. It is a lengthy operation but the only way to correct slight errors in the hull form or clerical mistakes in the offsets that are not apparent to the eye when working on a small drawing. Also parts of the plans that may appear complicated become simple in full-size layout. Plenty of time must be allowed for this step of the work and the builder should construct the boat mentally as he lays out his full-size plans.

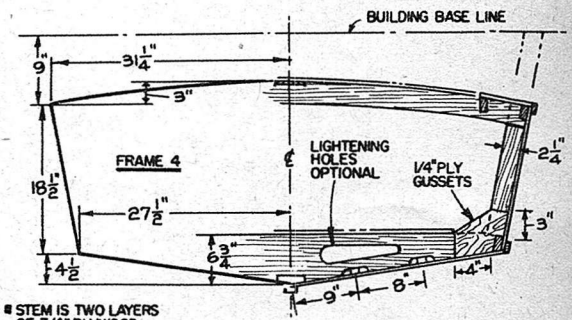
Each frame should be laid out for both sides from the dimensions adding the construction, since each bottom frame is a single piece from chine to chine across the centerline of the boat. From these outlines, templates can be made for marking off each part on the proper material so that the grain runs as long as possible on the turns. Cut out these parts and smooth the inner edges; any edge in contact with the planking does not need sanding since it will be beveled and notched later.

After checking each part of each frame against the full-size drawing, assemble with glue and three wood screws through each gusset into each part. The notches for the inner keel and chines (but not the bottom longitudinals or sheer stringer) can now be cut. Except for the frames which have deck beams—these should be included in the assembly—attach temporary crossbraces of any scrap material near the heads of the frames.

Prepare a template for the stem in a manner similar to that used for the frames. If you live near a boat yard, you may be able to pick up a discarded steam-bent frame that has the proper shape for this stem. If not, you can saw it to shape from white oak or make it from two pieces of ¾-inch plywood, gluing and screwing them together with the seam on the centerline. If you use plywood, care should be taken that no fastenings are located near the forward edge, where they might possibly interfere with the beveling for the planking.

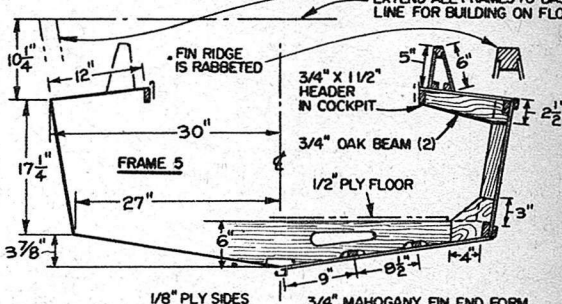


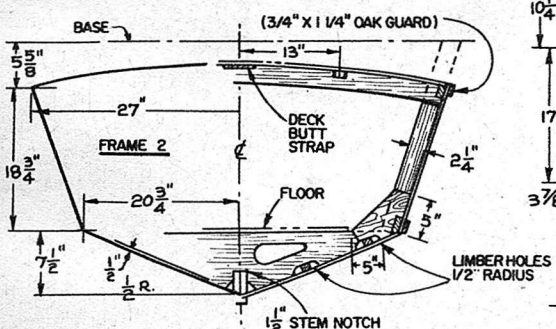


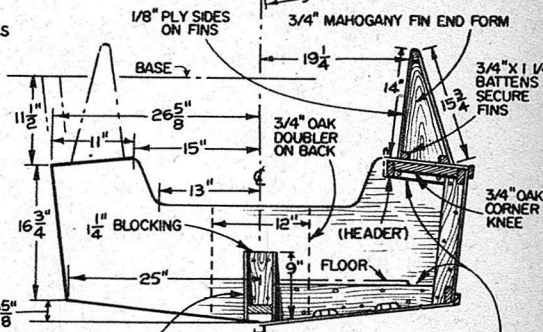


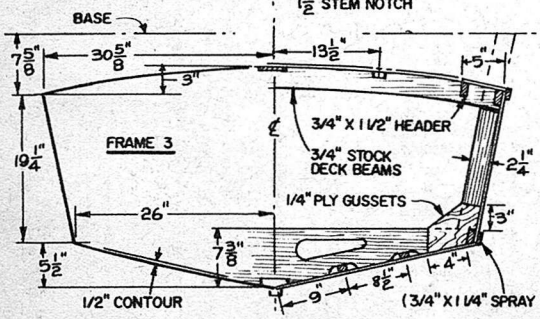
* STEM IS TWO LAYERS OF 3/4" PLYWOOD - -OR LAMINATED UP 1/2" OAK OR MAHOGANY- - OR THREE SECTIONS OF 1 1/2" OAK JOINED WITH SPLICE PLATE HELD WITH 5/16" BOLTS

EXTEND ALL FRAMES TO 'BASE' LINE FOR BUILDING ON FLOOR

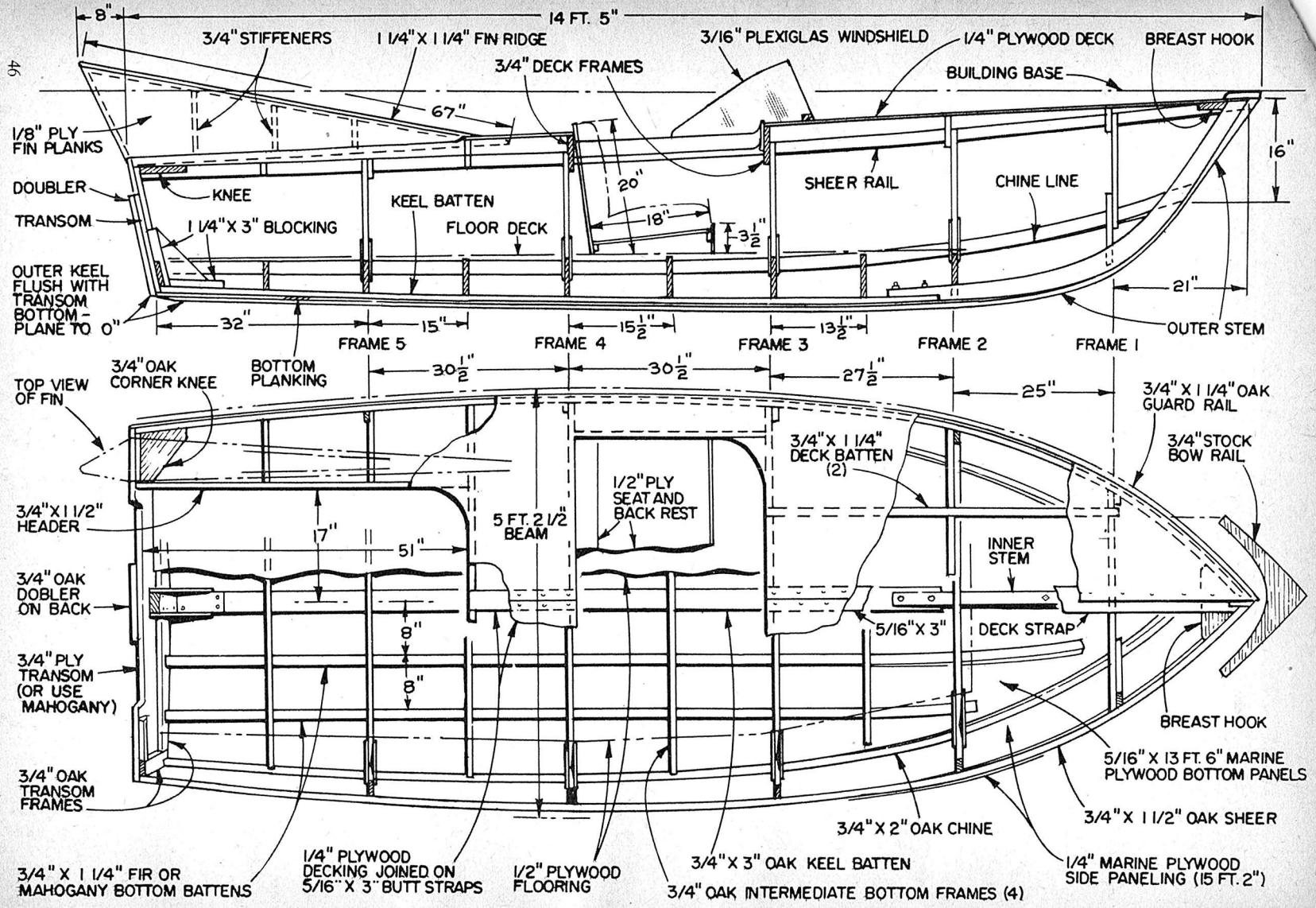








3/4" PLYWOOD TRANSOM (FLAT LAYOUT)


8"
14 FT. 5"
3/4" STIFFENERS
1 1/4" X 1 1/4" FIN RIDGE
3/16" PLEXIGLAS WINDSHIELD
1/4" PLYWOOD DECK
BREAST HOOK
3/4" DECK FRAMES
BUILDING BASE
67"
1/8" PLY FIN PLANKS
DOUBLER
TRANSOM
KNEE
1 1/4" X 3" BLOCKING
KEEL BATTEN
FLOOR DECK
20"
18"
3 1/2"
SHEER RAIL
CHINE LINE
16"
OUTER KEEL FLUSH WITH TRANSOM BOTTOM - PLANE TO 0"
32"
15"
15 1/2"
13 1/2"
21"
OUTER STEM
FRAME 5
FRAME 4
FRAME 3
FRAME 2
FRAME 1
3/4" OAK CORNER KNEE
BOTTOM PLANKING
30 1/2"
30 1/2"
27 1/2"
25"
TOP VIEW OF FIN
3/4" X 1 1/4" OAK GUARD RAIL
3/4" X 1 1/4" DECK BATTEN (2)
3/4" STOCK BOW RAIL
1/2" PLY SEAT AND BACK REST
5 FT. 2 1/2" BEAM
3/4" X 1 1/2" HEADER
17"
51"
INNER STEM
3/4" OAK DOBLER ON BACK
8"
8"
5/16" X 3"
DECK STRAP
3/4" PLY TRANSOM (OR USE MAHOGANY)
BREAST HOOK
5/16" X 13 FT. 6" MARINE PLYWOOD BOTTOM PANELS
3/4" OAK TRANSOM FRAMES
3/4" X 2" OAK CHINE
3/4" X 1 1/2" OAK SHEER
3/4" X 1 1/4" FIR OR MAHOGANY BOTTOM BATTENS
1/4" PLYWOOD DECKING JOINED ON 5/16" X 3" BUTT STRAPS
1/2" PLYWOOD FLOORING
3/4" X 3" OAK KEEL BATTEN
3/4" OAK INTERMEDIATE BOTTOM FRAMES (4)
1/4" MARINE PLYWOOD SIDE PANELING (15 FT. 2")

Build the boat on a level, firm wooden floor that measures not less than 10 by 18 feet. Prepare the floor by applying a cheap grade of pastel color, water paint. On this, lay out the boat's centerline and the other lines at right angles to it that represent the molded frame lines.

The transom and frames are now set up. This is done by attaching the frame heads to the floor with the molded line of each frame located as shown in the drawings. (In general, the molded frame line is the wider side of the frame after the bevels are cut.) Each frame is then secured by adding temporary battens and bracing.

Bend the inner keel in place in the notches provided for it and fasten to each frame with a single screw on the centerline. Set the stem up and secure to the inner keel as shown. Fit and add the chines fastening to each frame with one wood screw.

Next, notch the frames for the sheer stringers and fasten each stringer to each frame with one wood screw. The bottom longitudinals are temporarily clamped in place at about the locations shown and marked; then they are removed and the notches cut; then after fitting, each longitudinal is fastened to each frame with a single screw.

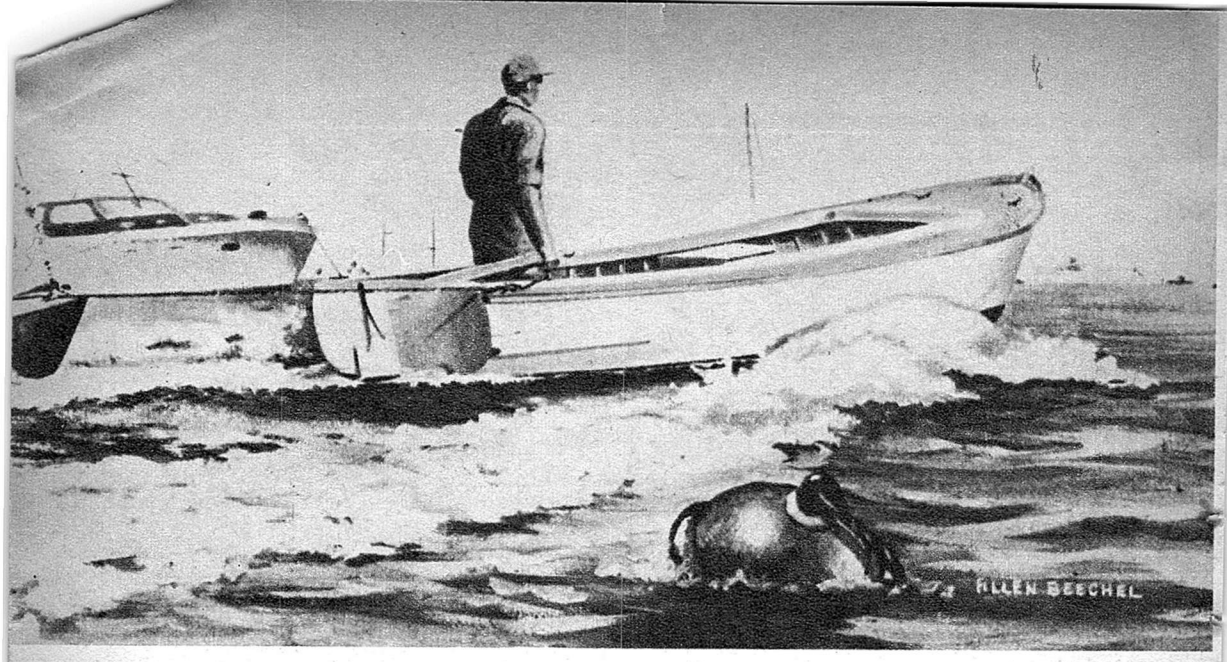
The framework is now trimmed, faired, and beveled with a plane and wood rasp until the entire frame is thoroughly checked for fairness, by springing fairly long narrow battens around the structure. All fastenings are to be recessed, and all voids are to be filled so the plywood planking will touch evenly at all points.

Next comes the planking. Obtain a panel of inexpensive plywood, ⅛ inch thick, and use it to make templates for the side and bottom. Put the sides on first, starting at the bow with eight-foot panels. Carefully fit each template, then lay it on good plywood, mark, and cut out. After cutting and fitting each member symmetrically on each side, drive the alternate screws. When all has been satisfactorily done, back out the screws, apply glue to all contact surfaces, replace the plank and redrive the screws as well as those previously omitted. Where two panels meet, install a butt strap between the chine and sheer stringer, and fasten the butt straps to the planking with clinched shingle nails. Plane off the bottom edge flush with the bottom of the chine log so the bottom planking will fit close together along the bottom edge.

Install the bottom planking in a similar manner, laying the eight-fot panels from the after end of the boat or transom so the butt straps on the bottom won't be near those on the sides. The bottom straps should be continuous from inner keel to chines. Notch the bottom longitudinals as required. It will be helpful when bending the bottom in place at the stem to soak it in hot water before applying it the first time. If this is done, allow it to dry before removing it to apply the glue. The outer edge should be planed flush with the outer surface of the side planking. To protect the raw plywood edges where the bottom laps the sides, spray strips are fitted, setting them in non-hardening marine-bedding compound when fastened. The exposed edges of the plywood along the stem and keel are covered with an outer stem and keel, and fastened with long wood screws after being set in non-hardening marine-bedding compound. To make this piece more pliable, boil it for half an hour before installing it.

Now turn the boat over and set it on two sawhorses fitted with well-padded chocks. Remove the crossbraces, install the deck stringers and bridge-deck framing, and cut off the frame projections. Trim and fair the beams, sheer stringers, coaming corner filler pieces, breasthook, quarter knees, and frameheads to take the plywood decking. Fit the decking, butting it over a strap on the boat's centerline and fasten the decking to the deck framing. Fasten the guard rails over the outboard edges of the plywood decking, setting them in non-hardening bedding compound. The inboard edges of the plywood decking should be covered with the coamings which should be well rounded off and project about ¼ inch above the top of the decking.

Add the seat risers, seats, floorboards, back rests, tail fins, etc., and you're ready to sand, paint, and varnish the boat after all screw heads have been slightly recessed below the surface of the plywood to allow for filler over the heads before painting. Remember that the surface to be painted must be smooth, dry, and clean. The finish is built up on this, inside and out, using at least two coats of plywood sealer and three coats of paint or varnish. One or two thick coats are useless. Since cheap paint will not last, use only recognized marine-paint manufacturer's products. After applying each coat, allow it time to dry thoroughly and then sand it down before starting the next coat. Use only standard colors—a non-standard hue will prove troublesome later when it may be necessary to touch up a damaged surface. •



MARY JANE

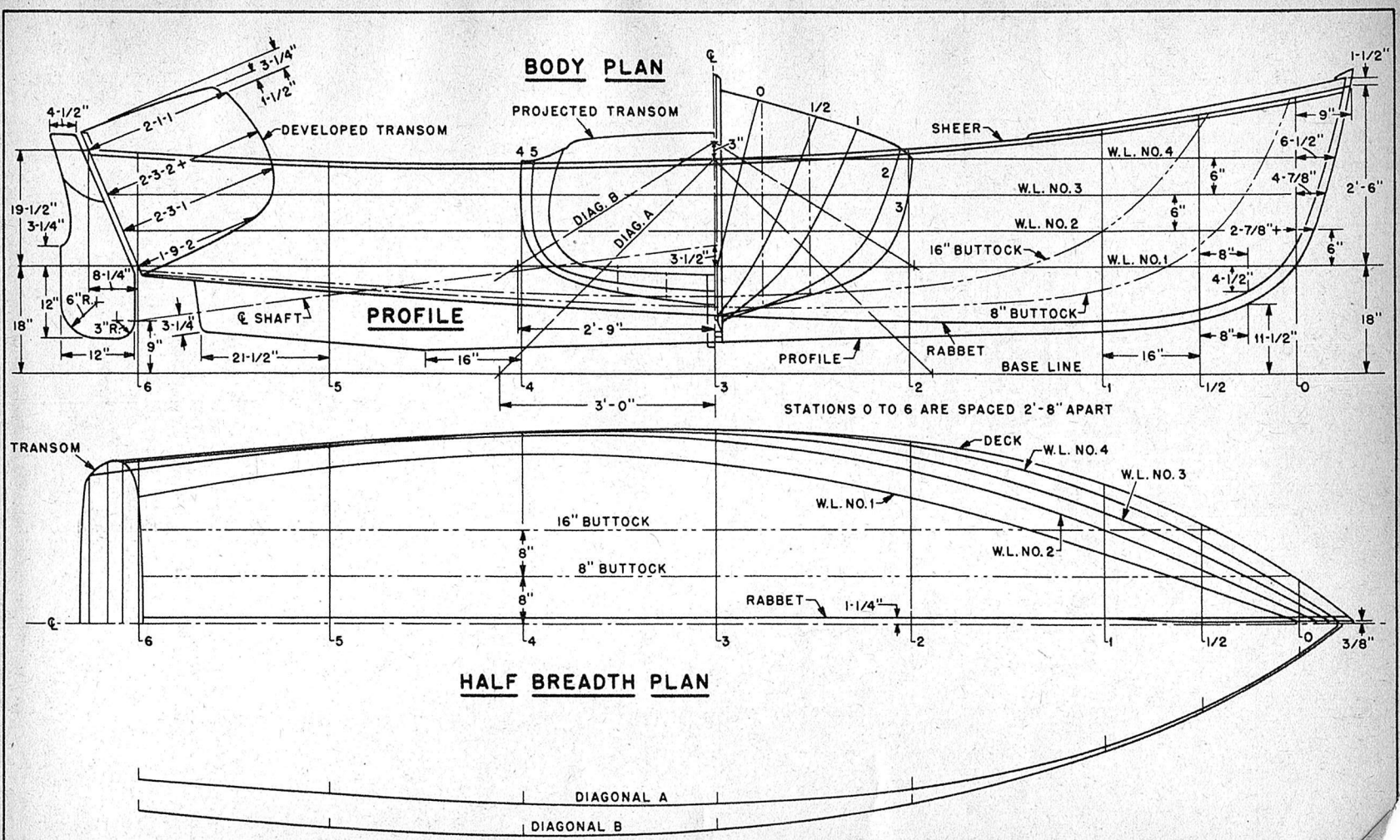
by Robert M. Steward

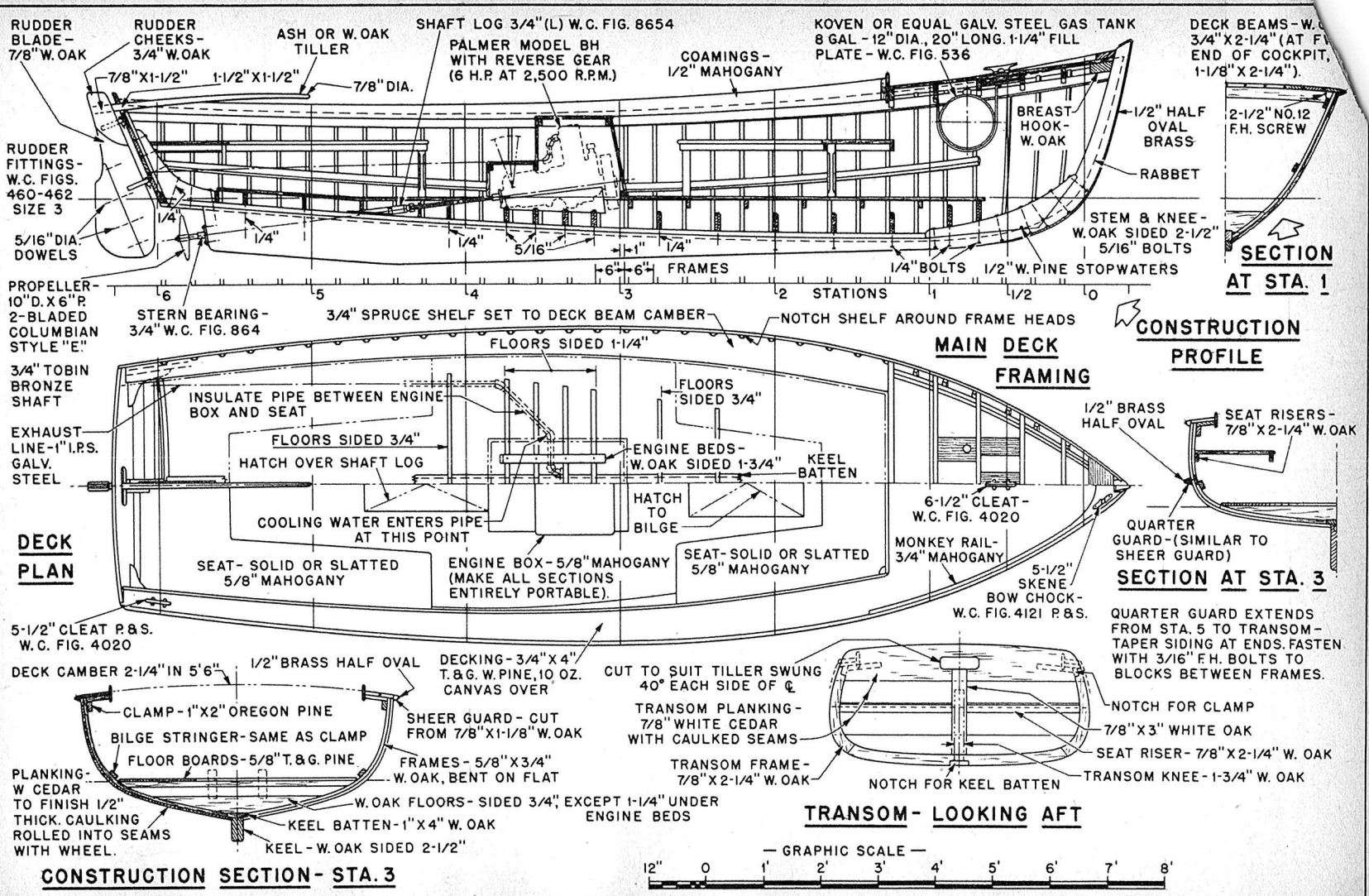
Measuring 17 feet 7 inches, this round-bottom inboard launch offers the challenge of real boat building, but on a small scale.

MARY JANE is a round-bottom launch 17 feet 7 inches overall, with a beam of 5 feet 8 inches and shallow draft of 14 inches. This boat is powered with a small inboard engine. The cost of fuel will be very small and the tank holding a full day's supply is a permanent part of the boat, but the owner must be content with moderate speeds of up to ten miles an hour depending on the load.

Mary Jane was designed for those amacovered with canvas in the usual manner. their hand at a real boat building job on a small scale. It is a matter of opinion, of course, but a round bottom hull of light construction is not much more difficult to build than a hard chine boat. The light frames and planking are easy to handle and the experience gained from her construction will be valuable should a larger boat be attempted in the future.

When the drawings for a boat include a conventional lines plan like that for Mary Jane the only proper way to start building is to redraw the lines full size in their entirety. When carefully done this job will take a full day's work at the very least, but will pay dividends throughout the construction. Drawing full size, which is done on building or drafting paper or on plywood panels, is called mold lofting. Molds to shape the boat are made from the body plan sections. A mold for each station is made of rough lumber and, to shape the hull in the spaces between the molds, wooden strips called ribbands are bent around the molds from stem to stern. The ribbands are closely spaced from keel to sheer to insure a properly shaped hull. Mary Jane is best built upside down, in which case the frames are steam bent on the outside of the ribbands. As the lines for small boats are drawn to the outside of the planking, this means that the thickness of planking, frames and ribbands must be deducted from the body plan sections before making the molds. If a hull is built right side up, only the planking thickness is deducted, for then the frames are bent inside of the ribbands and the ribbands are removed one by one as they interfere with the planks being applied.


BODY PLAN
PROJECTED TRANSOM
DEVELOPED TRANSOM
SHEER
PROFILE
DIAG. B
DIAG. A
16" BUTTOCK
8" BUTTOCK
W.L. NO. 4
W.L. NO. 3
W.L. NO. 2
W.L. NO. 1
RABBET
BASE LINE
PROFILE
STATIONS 0 TO 6 ARE SPACED 2'-8" APART
TRANSOM
DECK
HALF BREADTH PLAN
DIAGONAL A
DIAGONAL B


RUDDER BLADE - 7/8" W. OAK
RUDDER CHEEKS - 3/4" W. OAK
7/8" X 1-1/2"
1-1/2" X 1-1/2"
ASH OR W. OAK TILLER
7/8" DIA.
SHAFT LOG 3/4" (L) W.C. FIG. 8654
PALMER MODEL BH WITH REVERSE GEAR (6 H.P. AT 2,500 R.P.M.)
COAMINGS - 1/2" MAHOGANY
KOVEN OR EQUAL GALV. STEEL GAS TANK 8 GAL - 12" DIA., 20" LONG. 1-1/4" FILL PLATE - W.C. FIG. 536
DECK BEAMS - W.C. 3/4" X 2-1/4" (AT F END OF COCKPIT, 1-1/8" X 2-1/4").
BREAST HOOK - W. OAK
1/2" HALF OVAL BRASS
RABBET
2-1/2" NO. 12 F.H. SCREW
RUDDER FITTINGS - W.C. FIGS. 460-462 SIZE 3
5/16" DIA. DOWELS
1/4"
1/4"
1/4"
5/16"
1"
1/4"
6" 6" FRAMES
1/4" BOLTS
1/2" W. PINE STOPWATERS
STEM & KNEE - W. OAK SIDED 2-1/2" 5/16" BOLTS
SECTION AT STA. 1
PROPELLER - 10" D. X 6" P. 2-BLADED COLUMBIAN STYLE "E"
STERN BEARING - 3/4" W.C. FIG. 864
6 5 4 3 2 STATIONS 1 1/2 0
3/4" SPRUCE SHELF SET TO DECK BEAM CAMBER
NOTCH SHELF AROUND FRAME HEADS
CONSTRUCTION PROFILE
MAIN DECK FRAMING
FLOORS SIDED 1-1/4"
3/4" TOBIN BRONZE SHAFT
INSULATE PIPE BETWEEN ENGINE BOX AND SEAT
FLOORS SIDED 3/4"
EXHAUST LINE - 1" I.P.S. GALV. STEEL
FLOORS SIDED 3/4"
HATCH OVER SHAFT LOG
ENGINE BEDS - W. OAK SIDED 1-3/4"
KEEL BATTEN
HATCH TO BILGE
COOLING WATER ENTERS PIPE AT THIS POINT
6-1/2" CLEAT - W.C. FIG. 4020
1/2" BRASS HALF OVAL
SEAT RISERS - 7/8" X 2-1/4" W. OAK
QUARTER GUARD - (SIMILAR TO SHEER GUARD)
SECTION AT STA. 3
DECK PLAN
SEAT - SOLID OR SLATTED 5/8" MAHOGANY
ENGINE BOX - 5/8" MAHOGANY (MAKE ALL SECTIONS ENTIRELY PORTABLE).
SEAT - SOLID OR SLATTED 5/8" MAHOGANY
MONKEY RAIL - 3/4" MAHOGANY
5-1/2" SKENE BOW CHOCK - W.C. FIG. 4121 P.&S.
QUARTER GUARD EXTENDS FROM STA. 5 TO TRANSOM - TAPER SIDING AT ENDS. FASTEN WITH 3/16" F.H. BOLTS TO BLOCKS BETWEEN FRAMES.
5-1/2" CLEAT P.&S. W.C. FIG. 4020
DECK CAMBER 2-1/4" IN 5'6"
1/2" BRASS HALF OVAL
DECKING - 3/4" X 4" T.&G. W. PINE, 10 OZ. CANVAS OVER
CUT TO SUIT TILLER SWUNG 40° EACH SIDE OF ℄
CLAMP - 1" X 2" OREGON PINE
SHEER GUARD - CUT FROM 7/8" X 1-1/8" W. OAK
TRANSOM PLANKING - 7/8" WHITE CEDAR WITH CAULKED SEAMS
NOTCH FOR CLAMP
7/8" X 3" WHITE OAK
BILGE STRINGER - SAME AS CLAMP
FLOOR BOARDS - 5/8" T.&G. PINE
FRAMES - 5/8" X 3/4" W. OAK, BENT ON FLAT
SEAT RISER - 7/8" X 2-1/4" W. OAK
TRANSOM KNEE - 1-3/4" W. OAK
TRANSOM FRAME - 7/8" X 2-1/4" W. OAK
NOTCH FOR KEEL BATTEN
PLANKING - W. CEDAR TO FINISH 1/2" THICK. CAULKING ROLLED INTO SEAMS WITH WHEEL.
W. OAK FLOORS - SIDED 3/4", EXCEPT 1-1/4" UNDER ENGINE BEDS
KEEL BATTEN - 1" X 4" W. OAK
KEEL - W. OAK SIDED 2-1/2"
TRANSOM - LOOKING AFT
CONSTRUCTION SECTION - STA. 3
— GRAPHIC SCALE —
12" 0 1' 2' 3' 4' 5' 6' 7' 8'

— TABLE OF OFFSETS —

	STATIONS	6	5	4	3	2	1	1/2	0
HEIGHTS ABOVE BASE LINE	SHEER	3-1-1	2-11-5+	2-11-2	3-0-1	3-1-7	3-4-7+	3-7-2	3-10-1
	8" BUTTOCK	1-4-6	1-2-5	1-0-3+	0-11-2	0-11-2+	1-2-0	1-9-2	—
	16" BUTTOCK	1-5-1+	1-3-0+	1-1-4	1-1-1	1-2-4+	2-0-0	3-4-4	—
	RABBET	1-4-5	1-1-7	0-11-5	0-9-7	0-8-7	0-8-6	0-10-5	1-9-3
	PROFILE	1-4-5		0-4-3	← STRAIGHT →		0-7-0	0-8-7	1-6-0
HALF BREADTHS FROM ℄	DECK	2-2-3	2-5-7	2-8-1	2-8-7	2-6-7	1-11-6	1-5-1	0-7-3
	W.L. NO. 4	—	—	—	2-8-6+	2-6-3	1-9-5	1-2-2+	0-4-7
	W.L. NO. 3	2-3-6+	2-6-5	2-8-3+	2-8-2	2-4-3	1-6-7+	0-11-7+	0-3-2
	W.L. NO. 2	2-3-3+	2-6-2	2-7-7	2-6-7+	2-1-7+	1-4-0	0-9-3	0-1-6+
	W.L. NO. 1	1-9-2	2-2-3	2-4-4+	2-3-1	1-9-3	0-11-7	0-6-2+	0-0-3
DIAGONAL A		2-2-2	2-4-3	2-6-0	2-6-0	2-3-4	1-8-4	1-2-3	0-5-3
DIAGONAL B		2-7-4	2-10-1	2-11-4	2-10-3	2-6-0	1-9-1	1-2-6	0-5-6

DIMENSIONS IN FEET-INCHES-EIGHTHS (TO OUTSIDE EDGE OF PLANKING)

The keel and stem are drawn on the full-size plans so that templates can be made and the shapes and rabbet lines transferred to the lumber for cutting. The shaft line also is drawn in, then transferred to the keel template as a guide for boring the shaft hole. In turn the engine beds are cut from a template made from the full-size drawing. Thus, when the transom, transom bevels and the stem and keel rabbets are considered, along with the molds and backbone members, the lofting is really essential work right at the beginning.

After setting up and rigidly bracing the keel and keel batten, stem, transom, molds and ribbands, the frame locations are marked along both sides of the keel at the rabbet, then the keel batten is notched for each frame. Cut the notches with a chisel, deep enough to hold the frame ends.

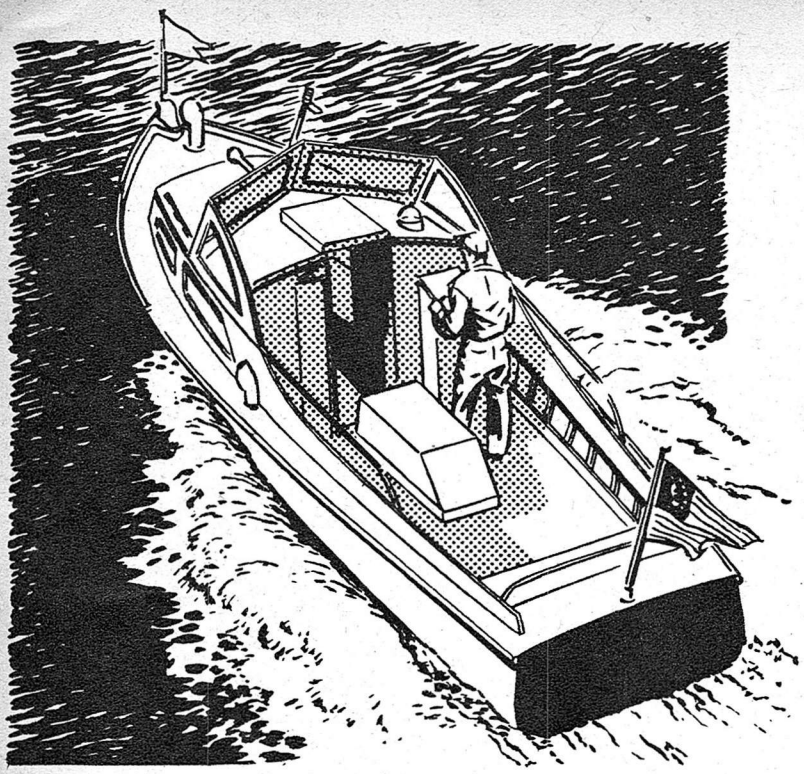
Before planking, the entire backbone and frames should have two good sopping coats of a copper naphthenate preservative such as Cuprinol; also coat the deck shelf before the decking is laid. Such a preservtive is inexpensive and very much worth while as a preventive of rot.

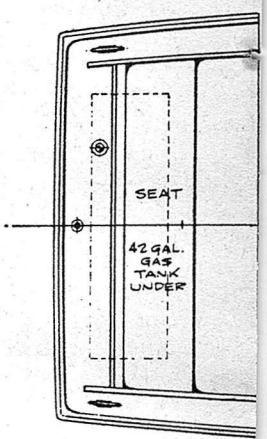
The planking is to finish ½ inch thick, so it must be ordered ⅝ inch to allow for planing smooth and sand-papering, also for hollowing the inside and rounding the outside of the planks on the hard turn of the bilge in the after sections of the hull. The plank fastenings to the frames can be copper nails riveted over burrs instead of the screws called for on the plans, but whether rivets or screws are used the planking is too thin to counterbore for plugging the holes. Instead, countersink the heads to a depth not more than ⅛ inch less than the plank thickness and fill the holes with composition.

A boat like the Mary Jane is comparatively easy to finish after the hull is completed. There are but a few deck beams to cut and fit as the side decks are laid on a shelf instead of beams. The tongue-and-groove straight-laid decking is simple but sufficient for this boat when covered with canvas in the usual manner. Seats, too, are simply made, and the outboard rudder could not be much easier to make and install. The mechanical department is the minimum, consisting of engine and exhaust, shafting and fuel tank. There should be a shut-off valve at the gas tank outlet and a strainer close to the valve. The copper tubing fuel line must have a loop to absorb vibration. Make the loop about six inches in diameter and locate it a few feet from the engine. Insulate the exhaust pipe where it is exposed between the engine box and the place where it runs under the seat on the port side. Make the engine box with portable sides and top. The forward side, of course, is the access to the flywheel for starting the engine.

Paint the boat with good marine grade coatings, using anti-fouling paint on the bottom below the boot top stripe. Many of the paint manufacturers have booklets explaining how to finish all boat parts.

The boat must be outfitted as required by the U. S. Coast Guard for class 1 motor boats. The compulsory items are few and all are for the boatman's protection. For anchoring, either a 15-pound yachtsman's type kedge anchor or a 10-pound Standard Danforth anchor should be provided and 125 feet of ½-inch manila line. •





COBIA

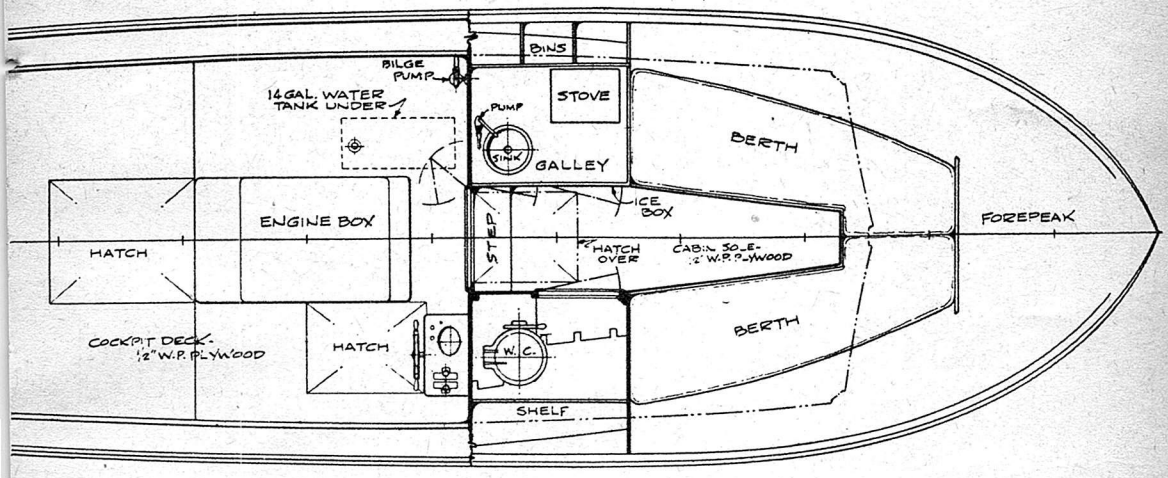
by Robert M. Steward

COBIA is a type of small power boat that is enjoying great popularity as a combination day cruiser, overnighter for two and sport fisherman. The cabin has two comfortable berths, an enclosed toilet room and small but adequate galley space with ice chest, utensil and food locker, sink and stove. There is storage space for gear under the berths and in the forepeak. Abaft the cabin there is more than twelve feet of cockpit, ample space for loafing or fishing. The "bridge" can be covered during poor weather with a folding navy type canvas shelter as shown dotted on the outboard-profile drawing.

The length overall is twenty-five feet six inches, beam is eight feet five inches to the outside of the planking, and the draft is about two feet depending upon the weight of fuel, crew and equipment. The round bottom hull form is such that moderate power is required for best efficiency, so at least 100 horsepower is recommended. With the engine shown the boat will run at about 20 miles on hour while 150 horsepower will boost the speed to about 24 miles. Of course, if the boat is lightly loaded with stores and fuel the speeds will be a little faster in each case.

Before any wood can be cut, the lines of the boat should be drawn full size on plywood or building board as described in texts on boat building. From the full-size drawing, templates are made for the stem, keel, etc., and the section molds are cut and assembled. Most builders would probably build this boat with the frames bent on the outside of ribbands spanning the molds from stem to transom, so this means that the thickness of the planking, frames

Day cruiser, fishing boat, overnighter for two—Cobia is 25 feet 6 inches of inboard versatility.



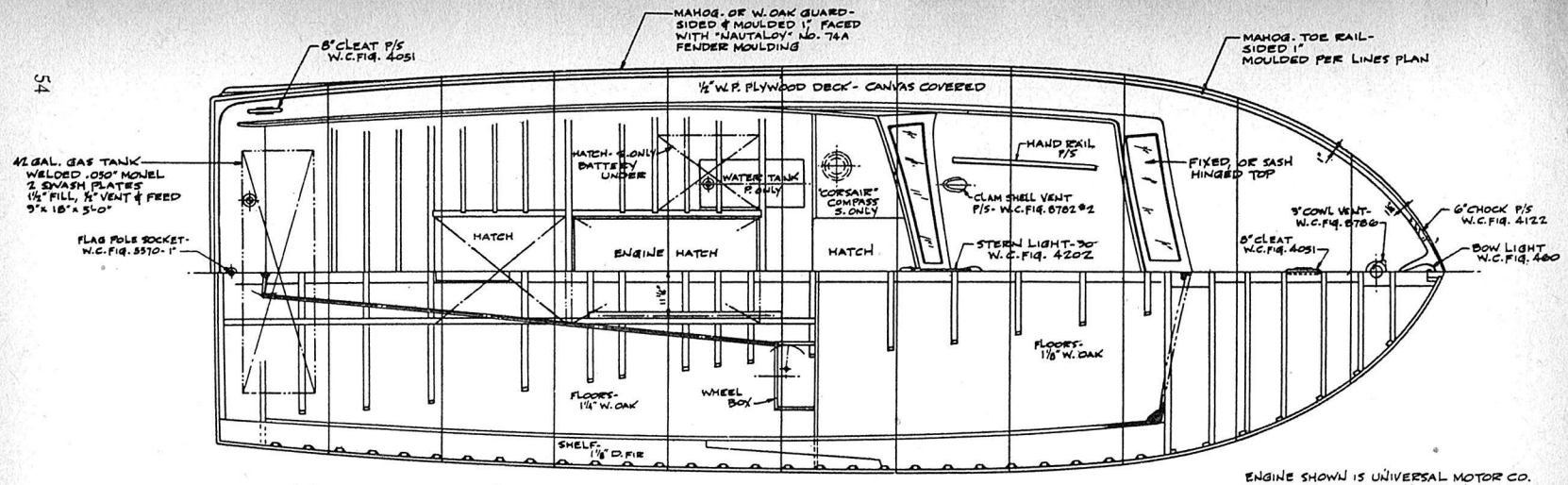
and ribbands must be deducted from the sections, which are drawn to the outside of the planking, before making the molds. This, too, is explained in boat building books.

The plans show smooth or carvel planking, but there is no reason why the planking cannot be lapstrake. In this case the planking thickness can be reduced to ⅝ inch. The planking would be fastened through the laps to the frames and also through the laps between frames, with copper nails riveted over burs.

The superstructure is modern in appearance, yet simple because the round at the top edge of the cabin is accomplished by working off the upper edge of the doubling strip that takes the ends of the cabin beams, and the forward corners of the cabin have rabbeted posts at the joints so outside can be rounded with a minimum of difficulty.

Speaking of joints, do not fail to use a bedding compound wherever a joint is made. Use a regular marine bedding compound in cabin joints, under the toe rail, cabin molding and guard, and under all deck fittings. In the joints between the stem parts and the keel use a heavy coat of thick white lead paste. Bed the cabin sides and cockpit coamings against the deck structure with Minnesota Mining and Manufacturing Company's EC-1159 compound. Even some professional builders are lax in this matter of bedding, the lack of which results in annoying leaks at first and finally in the inevitable rot that is so expensive to eliminate.

Hand in hand with bedding is the matter of ventilation. The minimum number of vents to be installed in Cobia is shown on



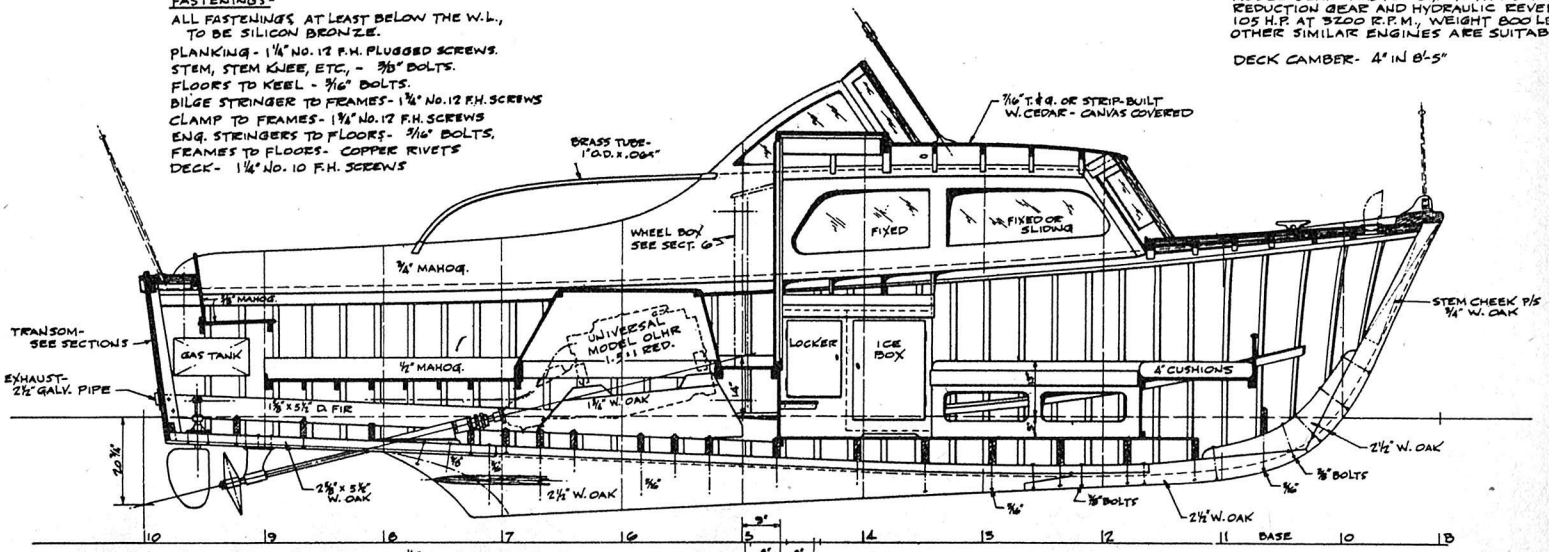
FASTENINGS-

ALL FASTENINGS AT LEAST BELOW THE W.L., TO BE SILICON BRONZE.

PLANKING - 1¼" No. 12 F.H. PLUGGED SCREWS.
STEM, STEM KNEE, ETC., - ⅜" BOLTS.
FLOORS TO KEEL - ⅜" BOLTS.
BILGE STRINGER TO FRAMES - 1⅝" No. 12 F.H. SCREWS
CLAMP TO FRAMES - 1⅝" No. 12 F.H. SCREWS
ENG. STRINGERS TO FLOORS - ⅜" BOLTS.
FRAMES TO FLOORS - COPPER RIVETS
DECK - 1¼" No. 10 F.H. SCREWS

ENGINE SHOWN IS UNIVERSAL MOTOR CO. MODEL OLHR "MASTER SIX" WITH 1.5:1 REDUCTION GEAR AND HYDRAULIC REVERSE. 105 H.P. AT 3200 R.P.M., WEIGHT 800 LBS. OTHER SIMILAR ENGINES ARE SUITABLE.

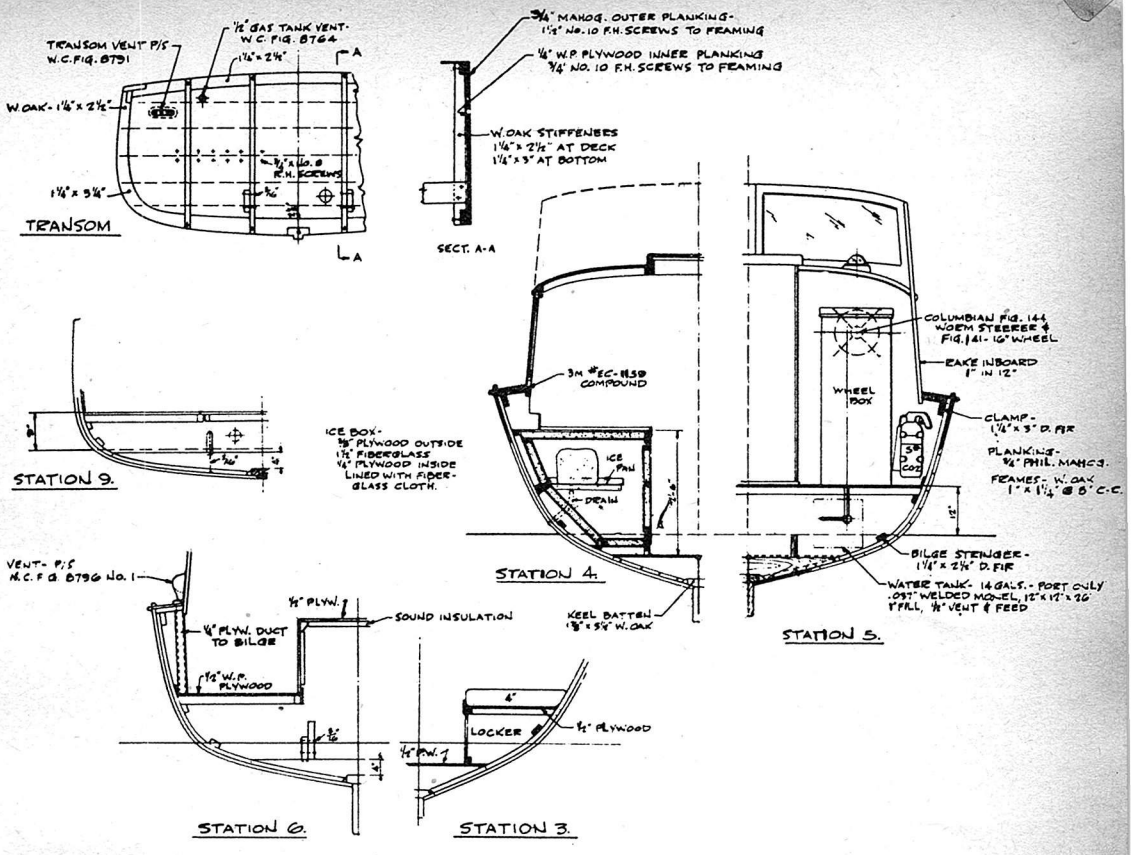
DECK CAMBER- 4" IN 8'-5"



RUDDER LEVER - COL. FIG. 454A
" PORT - " " 330
RUDDER - " " 562

PROP. SHAFT - 1¼" TOBIN BRONZE
SHAFT LOG - W.C. FIG. 8654
STRUT - COL. FIG. 131 WITH GOODRICH BEARING

PROPELLER - COLUMBIAN STYLE I, 3-BLADE, R.H., 15" DIAM., 15" PITCH.



the plans. Many boats develop rot in the transom and adjacent areas because they are closed in practically airtight. Note that Cobia has two vents in the transom and the space under the stern seat is open for passage of air.

The fuel and water tanks are shown of welded Monel, a nickel-copper alloy that is highly resistant to corrosion and is strong. Such metal will last a lifetime and it has gotten to the point just now where welded Monel tanks made by fabricators with modern welding machinery can produce tanks at no more cost than copper. Packless valves are recommended for fuel lines. Approved types are carried by marine supply houses.

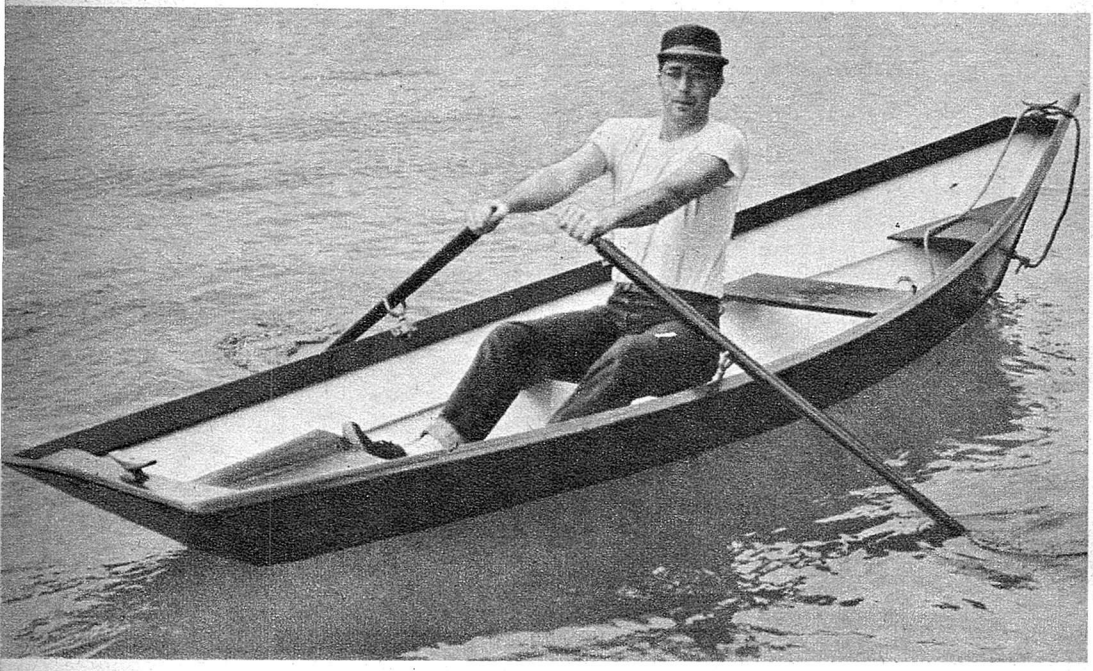
Various items of equipment are shown on the plans, identified by catalogue numbers of manufacturers. Naturally it is possible to use items of equal quality made by other manufacturers. Just do not use makeshift junk that will give trouble later. This particularly applies to the engine controls, both throttle and clutch. There are many good controls now on the market, such as the Morse Model S, that are ideal for this boat. One reason for having a hydraulic reverse is the low effort required for gear shifting, and this combined with a good control at the wheel box makes for an outfit you can rely upon at all times.

It is always best to use highest quality materials. Stick to durable materials such as silicon bronze for fastenings, mahogany or cedar for planking, good white oak for frames and backbone, genuine waterproof plywood where this material is specified, and marine paints. Boats of these materials will last a long time when care is taken during construction to eliminate causes for rot. After the hull has been framed give all parts two coats of a wood preservative like Cuprinol and after planking give the inside a couple of coats. Also apply the preservative to parts of the deck structure in generous quantity. •

POD

This beautiful 15-foot rowing dory slips through the water, lets the fish-hungry angler sneak up on those big ones.

by Gordon L. Hansen



THIS dory is a natural for the man who likes a bit of exercise and appreciates the simplicity and silence of a well-designed rowboat. A narrow bottom, tapered at both ends, enables her to slice through the water with a minimum of effort and flaring sides make her safe and dry in a chop.

Pod, with a beam of 52 inches, has an overall length of 15 feet, 5 inches and is 11 feet, 6 inches on the waterline. Three pieces of marine plywood make up the sides and bottom and no frames are required. This makes boatbuilding about as simple as it ever gets and the result is a light, clean hull with fewer places for rot to develop. However, for those who feel better with conventional framing, optional frames are included in the drawings.

In building Pod, the first step is the construction of a building frame. Two sawhorses, about 5 feet long and 2 feet high, are set up 9 feet apart. Two 2x6's, 16 feet long, are set on edge spanning the horses. These strongbacks are made parallel and level with 36 inches between the inside faces. They are also notched to fit the sawhorses and spiked in place.

Add Mold Anchors

Next the mold anchors are added. First locate station "A" over one of the sawhorses and mark this and the other stations on the upper edges of the strongbacks. A length of 2x4, at right angles to the strongbacks, serves as a mold anchor at each station. Each mold anchor is placed on the amidships side of the station with its edge coinciding with the station line. Spikes and diagonal braces hold them in place. Our draftsman, able fellow though he is, made a slight error in showing the location of these mold anchors. We, in turn, did not catch it until it was too late to change the draw-

ing. However, the stations are located correctly and everything will be fine if you move the forward and aft mold anchors toward the bow and stern respectively so that their edges coincide with the station lines. This, of course, changes the location of each mold so that its amidships side also coincides with the station line.

The molds themselves can be made from any 1-inch lumber that is strong and true. Lay them out full size on paper, then transfer the lines to the wood and cut them out and assemble them. Each mold is fastened to its corresponding anchor with ¼-inch lag screws and the upper edge of the anchor determines the base line. Make sure each one is vertical and that its centerline coincides with the centerline of the complete building frame; then bevel the edges to take the planking.

Basic Points

Before going ahead with instructions for assembling the hull, let's get clear on some basic points: Each piece of wood going into the hull is to be treated with wood preservative before assembly; all screws are flathead brass wood screws driven in at right angles to the surface of the wood unless otherwise noted; the screws must also be countersunk $\frac{1}{16}$ inch unless the heads fall in plywood, in which case we reduce the depth to $\frac{1}{32}$ inch.

We are now ready to prepare and attach the sides. Lay them out on the ¼-inch plywood sheet and cut them out with a sharp, fine-toothed saw to avoid splintering the edges. Reference points are then marked on each side as indicated in the drawing. Then clamp the sides over the molds with the reference points at station "B."

Fastening the chines to the side planks involves considerable bending so they are soaked with water as they are pulled into place. Be sure to let each chine overhang the plywood enough to allow for a bevel. Then hold them in place with clamps until you drive in ⅞-inch, No. 7 screws spaced 6 inches apart.

The stemson must be beveled to a proper fit. Pull in the sides and mark this bevel, then cut it as required. Also trim the chines to butt flush against the stemson. When the stemson has been fitted, fasten it in place with marine glue and 1¼-inch, No. 8 screws spaced 1½ inches apart, making sure it is in line with the centerline of the building frame.

Next make the transom. We built this up of pieces of oak which were doweled and glued, using a resorcin resin with catalyst. Be sure to make allowances for the bevels as noted in the drawing. When the piece is complete, hold it in place on the building frame, pull in the sides and mark the bevel. After cutting this bevel, the transom frame is fitted. This frame is beveled to match the transom and notched to receive the chines. It is then glued and screwed in place with 1½-inch, No. 8 screws spaced 3 inches apart and offset in two rows. When this is done, you can place the transom assembly on the building frame for a final fitting and secure it with marine glue and 1¼-inch, No. 8 screws spaced 1½ inches apart and offset in two rows.

Plane Excess

The next step is to plane the excess material off the chines, stemson and transom assembly. Take a straightedge, place a level on top and slide it along the chines at right angles to the centerline of the hull. By watching the points of contact, you will be able to locate the high spots and trim them off. Then take the plywood sheet from which the bottom will be cut and lay it on the chines. There should be good contact throughout.

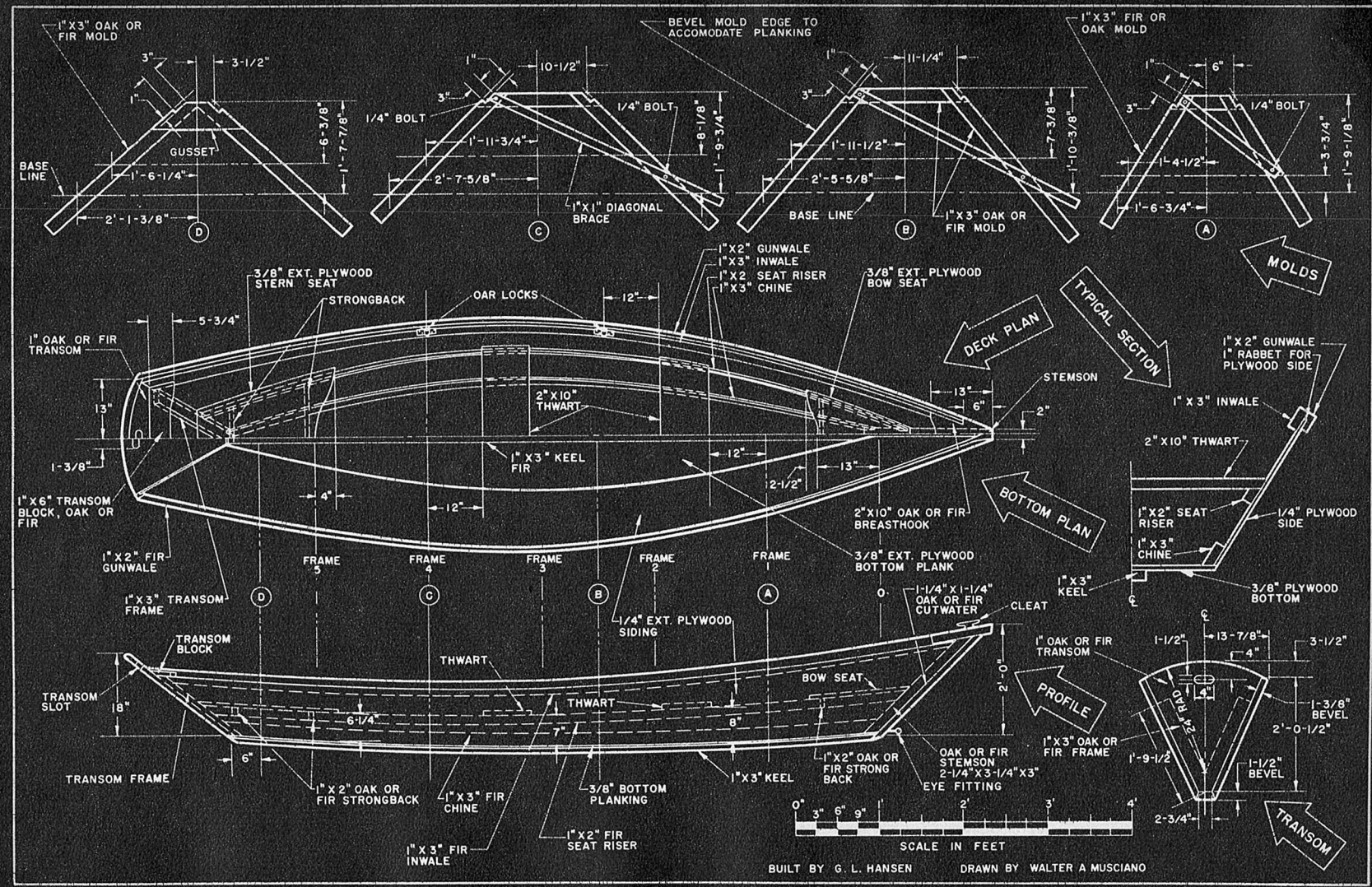
With the sheet resting on the chines, trace the outline of the bottom on it; then cut it to shape. Spread marine glue on the chines, place the bottom in position and fasten it with 1¼-inch, No. 8 screws spaced 3 inches apart. Screws near the transom must be driven in at an angle to be buried in the chine. Then shave the edges of the bottom flush with the sides. At this point the keel can be fastened in place with 1-inch, No. 8 screws spaced 8 inches apart and offset in two rows. Drive the screws through the bottom into the keel.

Install Spreaders

Now cut two temporary spreaders and install them between the sides at the sheer. Locate one 6 inches forward of station "B" and the other 6 inches aft of station "C." The hull can then be removed from the molds.

The seat risers are trimmed to fit flush against the stemson and transom frame. They are clamped in position and fastened with ⅞-inch, No. 7 screws spaced 6 inches apart and driven in from the outside through the planking. The top edges of the risers must be planed so that the seats lie flush on them.

After sanding and priming the hull, install the two thwarts. Allow very light contact between the ends of the thwarts and the side planks and fasten them to seat risers with three 1½-inch, No. 8 screws in



BUILT BY G. L. HANSEN DRAWN BY WALTER A MUSCIANO

each end. The temporary spreaders can now be removed.

The seat risers are notched to a depth of ⅜ inch to take the strongbacks which help support the seats. The strongbacks are cut to fit into the notches flush with the tops of the risers and also beveled so that they fit snug when tapped into place. No fastenings are used between the strongbacks and the risers but the seats are secured to the risers and strongbacks with 1-inch, No. 8 screws spaced 9 inches apart. It is best to paint the undersides of the seats before installation.

Rabbet Gunwales

The gunwales are rabbeted ¼x1 inch to cover the edge of the plywood, then clamped in place on the side planks. Make sure the gunwale is at the right height to be faired into the transom, then drive in 2-inch, No. 10 screws horizontally through the gunwales into the transom. Screw the gunwales to the stemson temporarily so the clamps can be removed.

The ends of the inwales are cut to butt flush against the stemson. Clamp those ends into position, flush with the top of the gunwale and then work aft, clamping and screwing as you go. Use 1¼-inch, No. 8 screws ¾ inch below the upper edge of the inwale and spaced 6 inches apart.

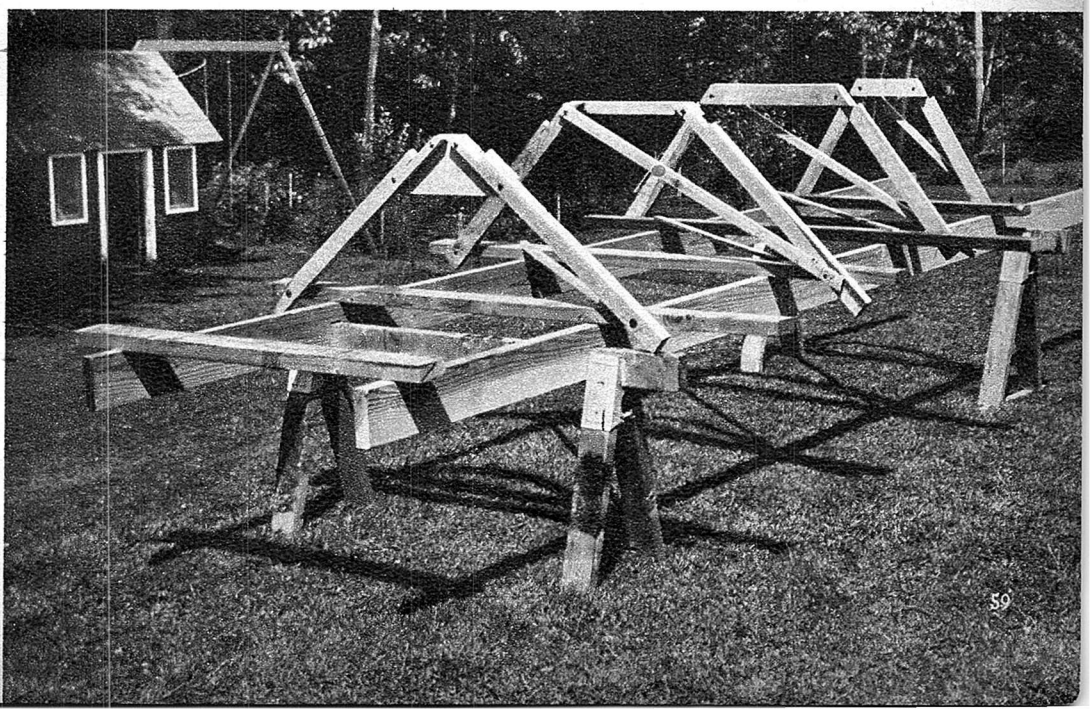
The after end is cut and beveled to fit flush against the transom proper, the transom frame being trimmed to just below the inwale.

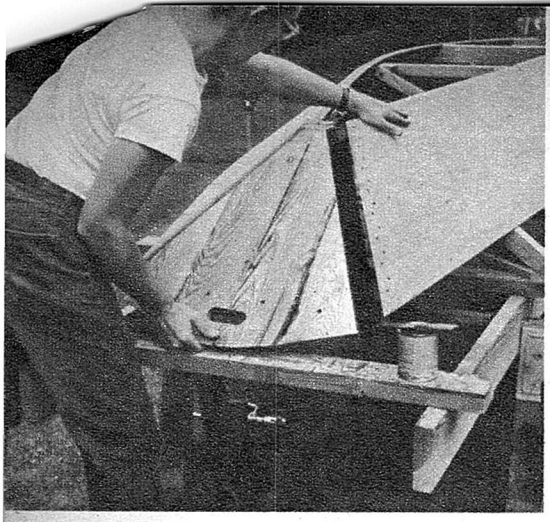
Tap the gunwale along its full length with a mallet to make sure the plywood is seated in the rabbet and then drive in 1¼-inch, No. 8 screws ½ inch above the lower edge of the gunwale, spacing them 12 inches apart.

Trim Gunwales

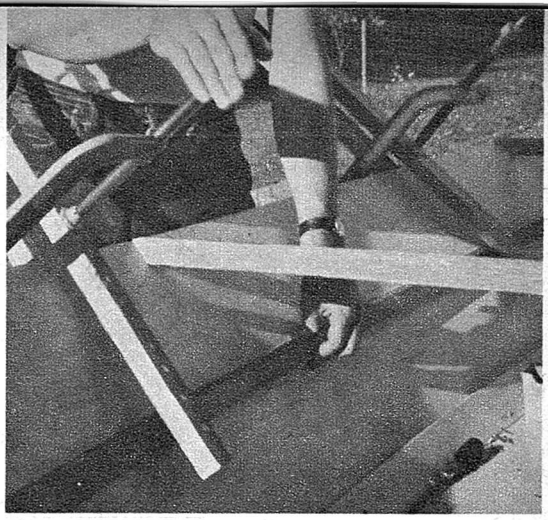
Up at the stem, trim off the gunwales at the point where they converge naturally with a vertical cut at right angles to the hull centerline. Measure back along the centerline 6 inches and make a similar cut to a depth of about 1¾ inches. In determining the exact depth of cut, remember that the upper face of the breasthook will have to blend with both the inwale and gunwale and its lower face will have to blend with the gunwale. Next cut in from the apex of the stemson, parallel to the sheer and approximately 1¾ inches below it, over to the bottom of the vertical cut. Bevel the breasthook as required and screw it to the stemson with two 3-inch, No. 14 screws. Also drive two of the same screws through the gunwale and inwale into the breast-

The building frame. Longitudinals are notched to fit sawhorses, 2x4's support the molds.





The transom of boat is installed. Marine glue and screws through the side planks secure it.



The method used to clamp seat risers is shown here. Note the temporary spreaders at the sheer.

hook. Next cut the forward edges of the side planks and keel flush with the leading edge of the stemson and then cut and bevel the cutwater and fasten it with 2-inch, No. 9 screws spaced 6 inches apart.

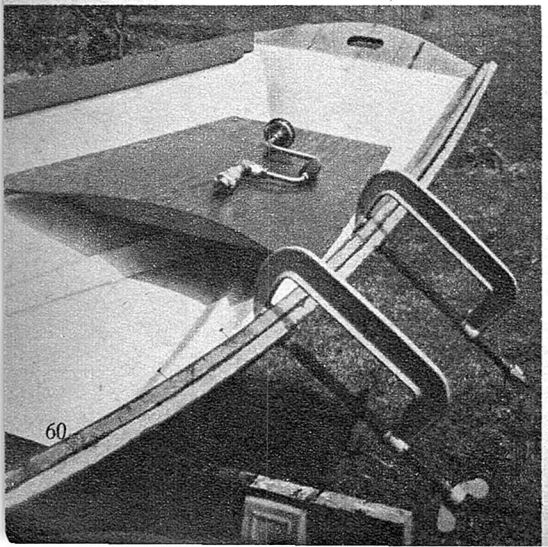
The transom block is fitted with the lower face flush with the lower edge of the inwale. Drive two 3-inch, No. 14 screws horizontally through the gunwale and inwale and into the block and four of the same screws horizontally through the transom and into the block.

Finally, shave off all excess material so that the entire hull is trim and smooth. Putty over all screw heads, sand the hull down and paint it. Every surface should have three coats of marine paint, sanded lightly between coats. •

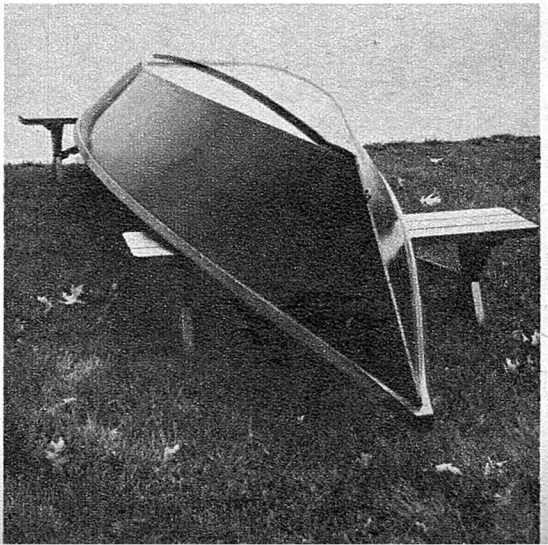
MATERIALS NEEDED

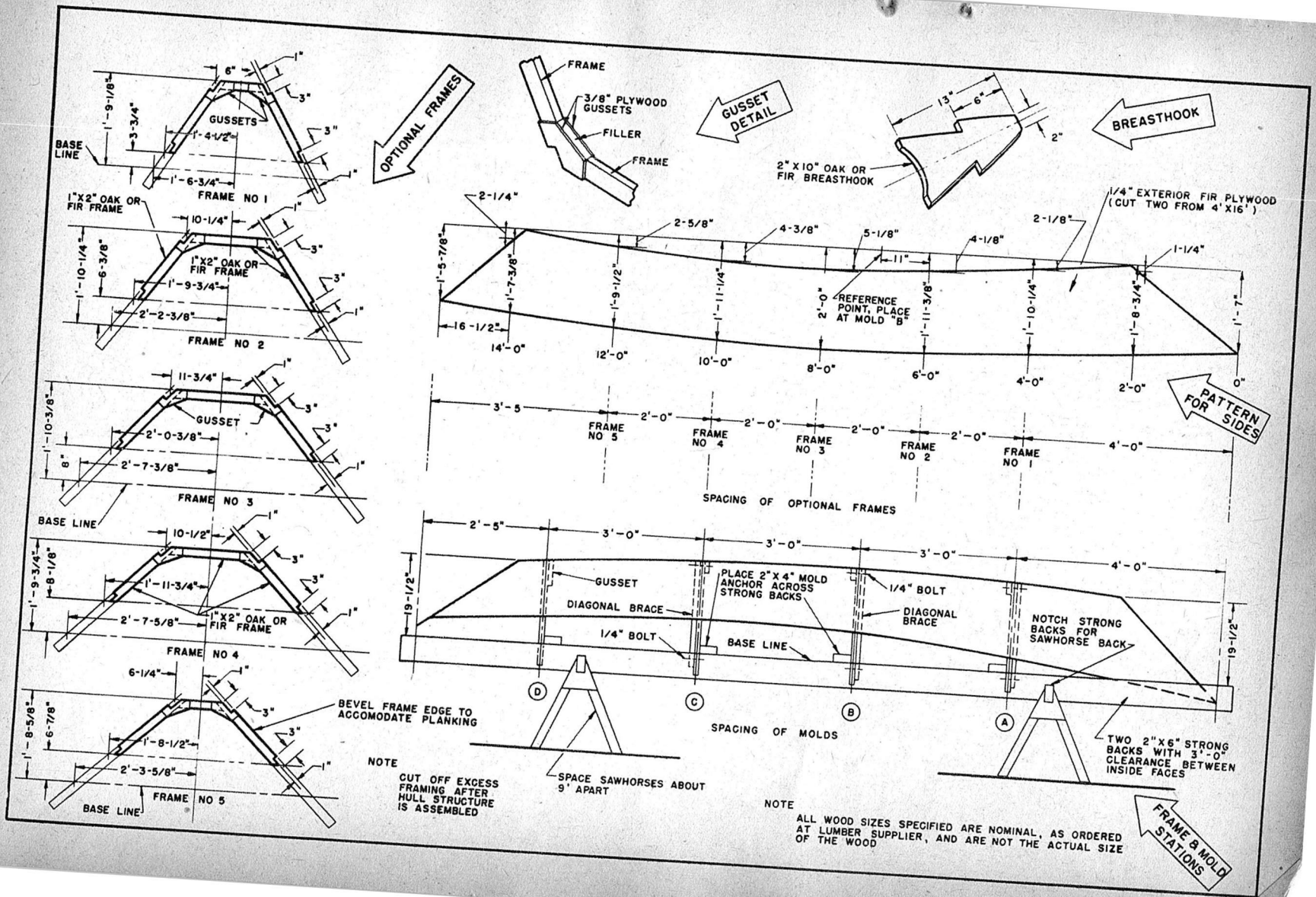
QUANTITY	*SIZE*	*USE*
EXTERIOR FIR PLYWOOD		
1 piece	1/4"x4'x16'	Side planks
1 piece	3/8"x4'x12'	Bottom plank, stern seat and bow seat.
CLEAR, EDGE GRAIN FIR		
2 pieces	1"x2"x12'	Chines
2 pieces	1"x2"x14'	Seat risers
2 pieces	1"x2"x16'	Gunwale
2 pieces	1"x3"x16'	Inwales
1 piece	1"x3"x12'	Keel
OAK OR FIR		
1 piece	2 1/4"x3 1/4"x3'	Stemson
1 piece	1 1/4"x1 1/4"x3'	Cutwater
1 piece	2"x10"x14"	Breasthook
1 piece	1"x8"x8'	Transom
1 piece	1"x3"x5'	Transom frames
1 piece	1"x6"x30"	Transom block
FASTENINGS		
2 gross	1 1/4", No. 8	FH brass wood screws
1 gross	7/8", No. 7	FH brass wood screws
4 dozen	1", No. 8	FH brass wood screws
3 dozen	1 1/2", No. 8	FH brass wood screws
1 1/2 dozen	3", No. 14	FH brass wood screws
1 dozen	2", No. 9	FH brass wood screws

Starting at the stem and working aft, the inwales are clamped and then screwed into place.



The Pod has beautiful lines and moves along with very little effort on the part of the oarsman.




OPTIONAL FRAMES
FRAME NO 1
FRAME NO 2
FRAME NO 3
FRAME NO 4
FRAME NO 5
BASE LINE
GUSSETS
1"X2" OAK OR FIR FRAME
GUSSET
BEVEL FRAME EDGE TO ACCOMODATE PLANKING
NOTE
CUT OFF EXCESS FRAMING AFTER HULL STRUCTURE IS ASSEMBLED
GUSSET DETAIL
FRAME
3/8" PLYWOOD GUSSETS
FILLER
BREASTHOOK
2" X 10" OAK OR FIR BREASTHOOK
1/4" EXTERIOR FIR PLYWOOD (CUT TWO FROM 4' X 16')
REFERENCE POINT, PLACE AT MOLD "B"
PATTERN FOR SIDES
SPACING OF OPTIONAL FRAMES
GUSSET
DIAGONAL BRACE
1/4" BOLT
PLACE 2" X 4" MOLD ANCHOR ACROSS STRONG BACKS
NOTCH STRONG BACKS FOR SAWHORSE BACK
SPACING OF MOLDS
SPACE SAWHORSES ABOUT 9' APART
TWO 2" X 6" STRONG BACKS WITH 3'-0" CLEARANCE BETWEEN INSIDE FACES
NOTE
ALL WOOD SIZES SPECIFIED ARE NOMINAL, AS ORDERED AT LUMBER SUPPLIER, AND ARE NOT THE ACTUAL SIZE OF THE WOOD
FRAME & MOLD STATIONS

SABOT

There's eight feet of fun and usefulness packed into this sturdy plywood pram dinghy.

THE plans herewith are those of an eight-foot, lightweight pram of the following dimensions:

Length overall	7 feet 11 inches
Beam	4 feet 0 inches
Depth	16 inches
Sail area	36 square feet

A centerboard has been installed in place of the original leeboard, the sliding gunter changed to Marconi rig and a rudder and tiller instead of the steering oar. The vee bottom is slightly more difficult to build than the flat bottom, but is superior especially for sailing and towing.

The hard or sharp chine is simple in construction, but the flat chine is better, improving the looks and making rowing and towing in a heavy sea safer.

Order your material from this list:

Planking. Two panels resin-bonded fir plywood, ¼ in. 3 ply, 48x96 in. This is sufficient for the bottom and side planking and the bow deck with a little to spare.

Transoms. Bow and stern, one piece African or Philippine mahogany ¾ in. thick, about 9 in. wide, 10 ft. long.

Inner keel. One piece Sitka spruce, pine or mahogany ¾ x 3 in. x 7 ft. 6 in.

Outer keel. One piece white oak ¾ in. by 2 in. x 7 ft. 6 in. (tapered).

Chine Stringers. Two pieces ⅞ in. x 2¼ in. x 8 ft.

Gunwale Stringers. Two pieces Sitka spruce, each 1¾ x 1 in. x 8 ft.

Gunwale Cap. Mahogany ¼ x 5 in. (to finish 1⅜ in. wide) by 16 ft.

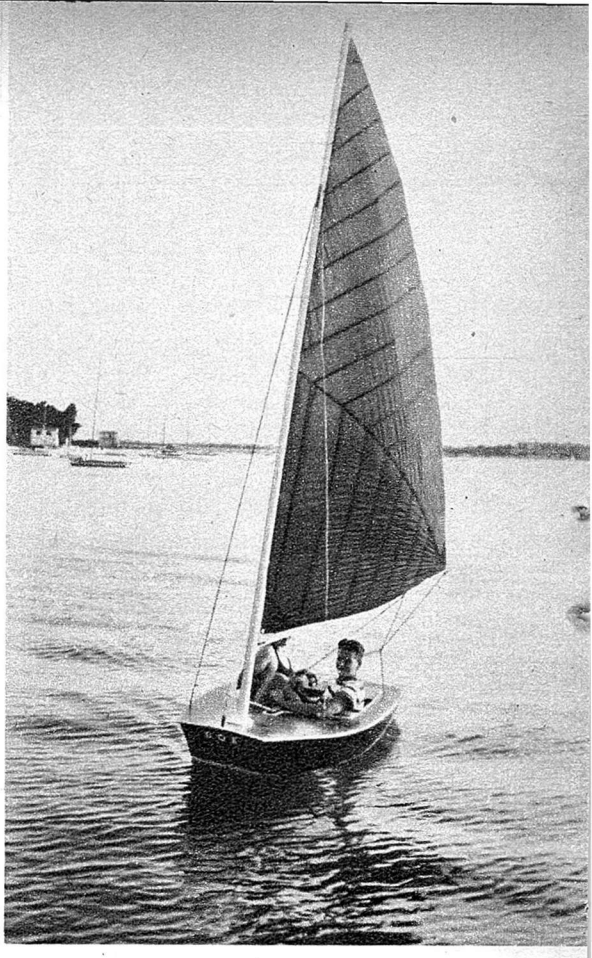
Bent Frames. Three pieces each ½ x ¾ in. x 5 ft. 6 in.

Thwarts. Mahogany, one piece $\frac{9}{16}$ x 7 in. x 10 ft. to be cut for three thwarts.

Flooring. Cedar, four pieces each ⅜ in. x 6 in. x 5 ft. 2 in., with three cleats each, white oak, ½x¾x13 in.

Knees. Crooks of ⅝ in. Hackmatack.

Fastenings. Use bronze screw fastenings throughout. Two gross ¾-in. No. 6 for planking, gunwale cap. etc. Three dozen 1 in. No. 8 for frames, fashion pieces, etc., three dozen 1¼ in. for outer keel, etc., and a few miscellaneous sizes.



Fred B. Deere of Dallas, Texas, built Sabot for his wife and himself. He recommends it as ideal as a trainer for the youngster learning to sail.

Build the boat upside down and make the building form strong and rigid.

Before finally gluing the planking in place, drive all screws, then back them out, spread cold resinous glue along the contact surfaces and edges, and fasten down firmly, redriving all screws.

At first it is better to erect a temporary mold (Fig. I) on which the boat is built. When planked, the hull is lifted off and righted for the deck and interior finish.

To build this form secure one panel of inexpensive fir plywood (not the waterproof variety) ¾ in. x 4 ft. x 8 ft., 5-ply, for the temporary molds and another panel of ¼ in. 3-ply fir of the same material as a

FIG. II
MOLD CONSTRUCTION

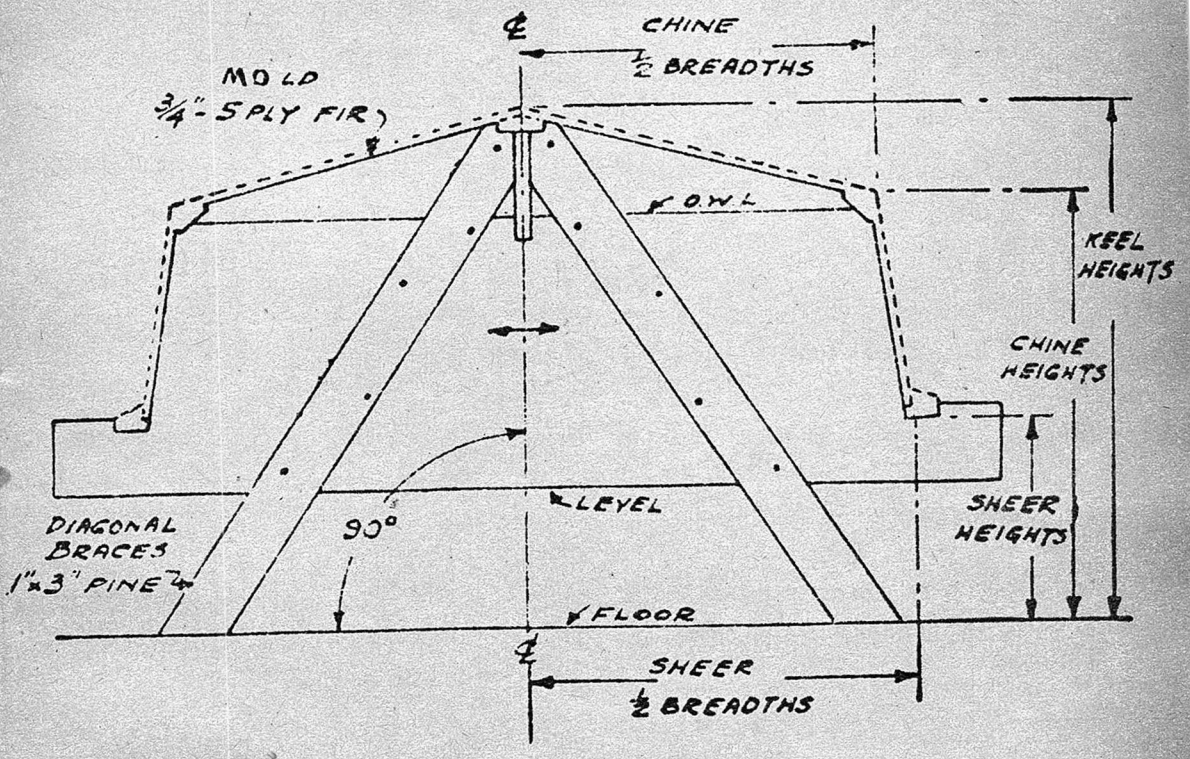


FIG. I
TEMPORARY BUILDING MOLD.

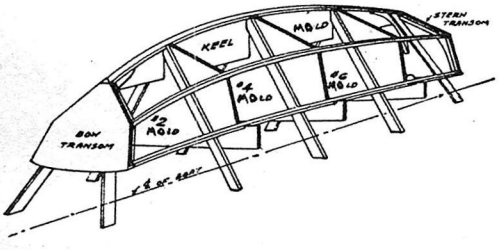


FIG. IV
KEEL MOLD

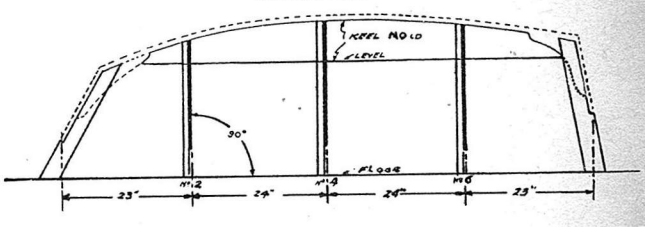
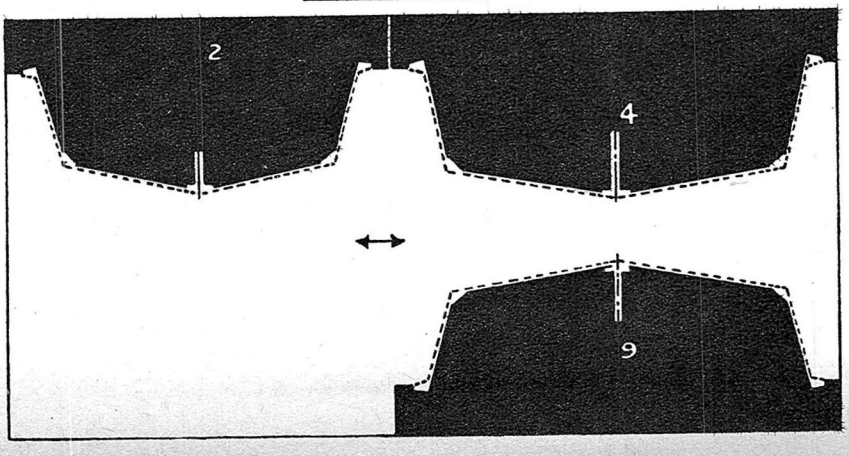
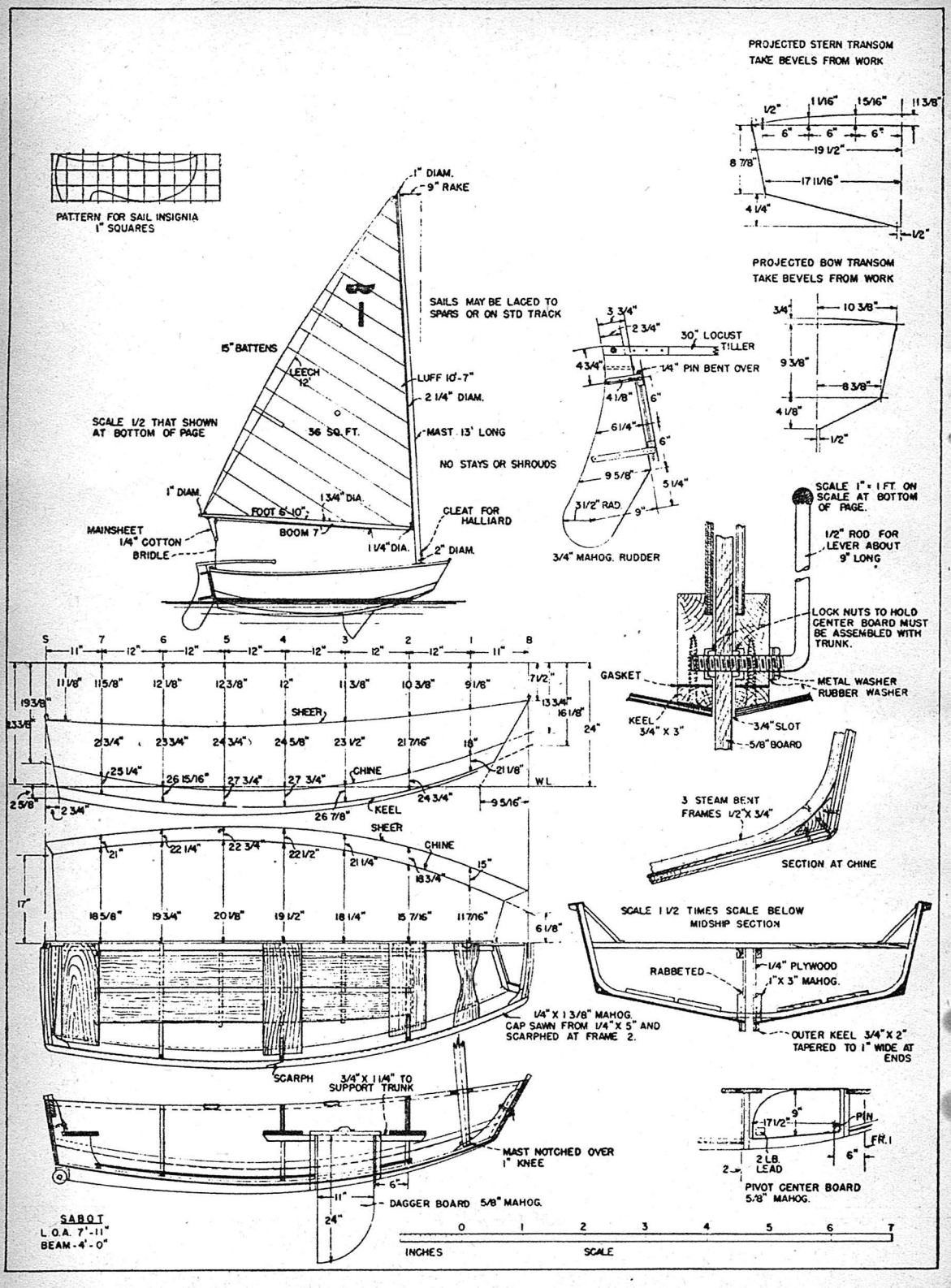


FIG. III
MOLD LAYOUT.




PROJECTED STERN TRANSOM
TAKE BEVELS FROM WORK
1/2"
1 1/16"
15/16"
1 13/8"
6"
6"
6"
19 1/2"
8 7/8"
17 11/16"
4 1/4"
1/2"
PROJECTED BOW TRANSOM
TAKE BEVELS FROM WORK
3/4"
10 3/8"
9 3/8"
8 3/8"
4 1/8"
1/2"
PATTERN FOR SAIL INSIGNIA
1" SQUARES
1" DIAM.
9" RAKE
SAILS MAY BE LACED TO
SPARS OR ON STD TRACK
15" BATTENS
LEECH
12'
LUFF 10'-7"
2 1/4" DIAM.
SCALE 1/2 THAT SHOWN
AT BOTTOM OF PAGE
36 SQ. FT.
MAST 13' LONG
NO STAYS OR SHROUDS
1" DIAM.
1 3/4" DIA.
FOOT 6'-10"
CLEAT FOR
HALLIARD
MAINSHEET
1/4" COTTON
BRIDLE
BOOM 7'
1 1/4" DIA.
2" DIAM.
3 3/4"
2 3/4"
30" LOCUST
TILLER
4 3/4"
1/4" PIN BENT OVER
4 1/8"
6"
6 1/4"
6"
9 5/8"
5 1/4"
3 1/2" RAD
9"
3/4" MAHOG. RUDDER
SCALE 1" = 1 FT. ON
SCALE AT BOTTOM
OF PAGE.
1/2" ROD FOR
LEVER ABOUT
9" LONG
LOCK NUTS TO HOLD
CENTER BOARD MUST
BE ASSEMBLED WITH
TRUNK.
GASKET
METAL WASHER
RUBBER WASHER
KEEL
3/4" X 3"
3/4" SLOT
5/8" BOARD
S
11"
7
12"
6
12"
5
12"
4
12"
3
12"
2
12"
1
11"
B
11 1/8"
11 5/8"
12 1/8"
12 3/8"
12"
11 3/8"
10 3/8"
9 1/8"
7 1/2"
19 3/8"
13 3/4"
16 1/8"
23 3/8"
SHEER
24"
23 3/4"
23 3/4"
24 3/4"
24 5/8"
23 1/2"
21 7/16"
18"
25 1/4"
26 15/16"
27 3/4"
27 3/4"
CHINE
21 1/8"
W.L.
25/8"
2 3/4"
24 3/4"
9 5/16"
26 7/8"
KEEL
3 STEAM BENT
FRAMES 1/2" X 3/4"
SECTION AT CHINE
SHEER
CHINE
21"
22 1/4"
22 3/4"
22 1/2"
21 1/4"
15"
18 3/4"
17"
18 5/8"
19 3/4"
20 1/8"
19 1/2"
18 1/4"
15 7/16"
11 7/16"
6 1/8"
SCALE 1 1/2 TIMES SCALE BELOW
MIDSHIP SECTION
RABBETED
1/4" PLYWOOD
1" X 3" MAHOG.
1/4" X 1 3/8" MAHOG.
CAP SAWN FROM 1/4" X 5" AND
SCARPHED AT FRAME 2.
OUTER KEEL 3/4" X 2"
TAPERED TO 1" WIDE AT
ENDS
SCARPH
3/4" X 1 1/4" TO
SUPPORT TRUNK
MAST NOTCHED OVER
1" KNEE
17 1/2"
9"
PIN
FR. 1
2 LB.
LEAD
2"
6"
PIVOT CENTER BOARD
5/8" MAHOG.
11"
6"
DAGGER BOARD 5/8" MAHOG.
24"
SABOT
L.O.A. 7'-11"
BEAM - 4'-0"
0
1
2
3
4
5
6
7
INCHES
SCALE

template for the hull planking of the boat.

On the lines the molds are shown spaced 12 inches apart. If only one boat is to be built, eliminate the odd numbered molds and use only Nos. 2, 4, 6. These are spaced 24 inches apart. The construction of these molds is shown in Fig. II.

Lay out each mold on the plywood (Fig. III). The lines are drawn and the offsets are measured to the outside of the planking. Cut each mold to the inside of the planking and provide a cut-out for keel, chines, gunwale stringer and the fore and aft keel mold.

This keel mold (Fig. IV) may be a piece of pine about 1 inch thick fitted into a slot in each mold; on this piece mark the location of each mold. The upper edge is shaped to the inside of the inner keel; the bottom edge should be level.

Care must be used in accurately placing each mold and securing it firmly to the floor. Each must be plumb and at right angles to the centerline of the boat. Secure the bow and stern transoms with two di- the bow and stern transoms with two diagonal legs (Fig. I). The bent keel the building mold by one screw through the keel into each mold; the ends are bolted to the bow and stern transom knees.

Follow the same procedure for the chine and gunwale stringers. Fit the latter so that the sheer will be correct and have neither hills nor valleys. If preferred, this may be fitted after the hull is lifted off the building form.

When planking the hull use the panel of ¼-inch ordinary plywood as a template. Fit this template as carefully as you would the planking itself. See that the plywood bears solidly and evenly against the keel and chine stringers and that the edges are properly beveled so that they will butt snugly against the edge of the adjacent plank panel. Remove this template, lay it on the panel of resin-bonded plywood and mark around its edge with a pencil (Fig. V). Cut this piece out on the band saw allowing a little all around for final fitting and beveling. Examine the contact surface very carefully. The fit should be as near perfection as it is within your ability to make.

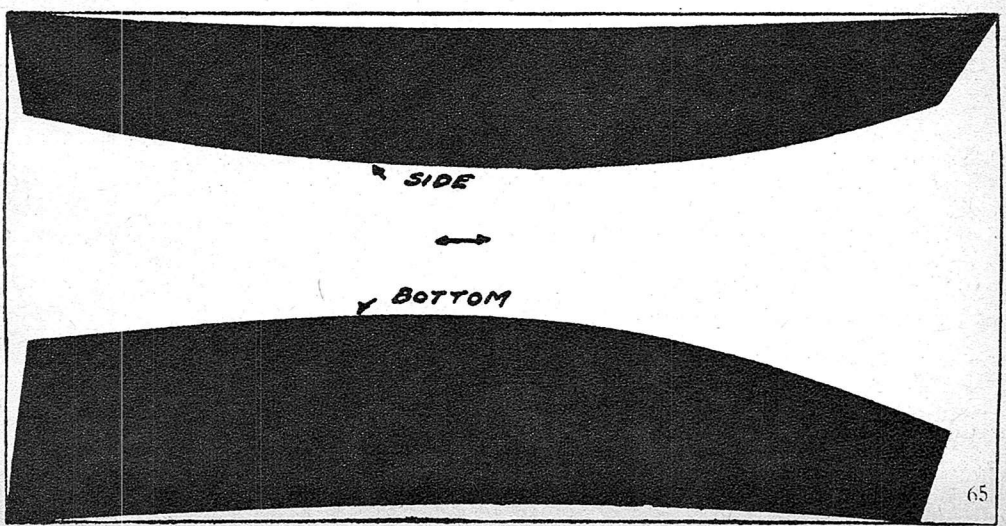
Fit this piece and screw-fasten in place, without glue. Now back out every fastening, lift the panel clear and brush off all drillings, chips and sawdust on the contact surfaces. Apply the two elements of the resin glue to these surfaces, replace the panel and redrive every fastening quickly.

Fit the skeg, then the outer keel. Glue and screw-fasten at all contact surfaces.

The boat can be removed from the form, turned upright and set on two chocks at a convenient height for the interior trim, finish and painting. Before sanding or painting, carefully scrape off surplus glue. Cement all nail holes and depressions in the hull, sandpaper lightly and apply the priming coat of paint or varnish immediately. You will find three to four coats of paint necessary on fir to hide the grain. •

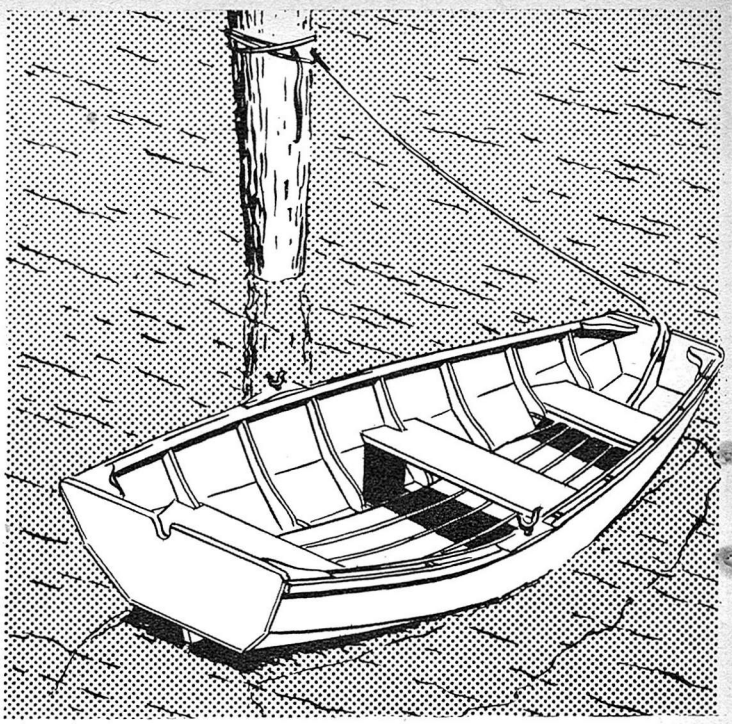
Fig. V

PLANK TEMPLATES



NEREIA PRAM

by L. Francis Herreshoff



Here's a pram—8 feet in length—that is simple to build, will tow and row easily and will stand up well under hard usage.

THE Nereia Pram is quite wide on the bottom with seats low so she may be stiff enough for general usefulness. She will undoubtedly tow well, should be easy to stow on board, and should not need lashing down excepting in the heaviest weather.

The little boat is of quite heavy construction so as to withstand hard use, but if one should prefer to plank her with laminated wood these thicknesses can be materially reduced. For those who intend to keep the dinghy on deck most of the time I would recommend laminated wood. However, for normal use the construction as shown should prove more useful.

The numbered description is as follows:

1. Bow piece, or bow transom, can be oak or mahogany, about ⅞ inch thick with a small notch at its upper edge for the painter when towing.

2. Bottom planking can be ¾-inch soft pine or cedar. If thinner planks or laminated wood are used it will be necessary to have an apron or border piece around the edges of the bottom so that there will be thickness enough for the planking fastenings. See dotted lines on section 2.

3. Bottom frames. Oak ⅝ by 1 inch.

4. Side frames. Oak ⅝ inch thick, shaped as shown and fastened to bottom framing with two 1¼-inch, No. 10 wood screws, and glued if convenient.

5. Lower strake, Cedar or soft pine, ⅜ inch thick.

6. Upper strake. Cedar or soft pine, $\frac{5}{16}$ inch thick.

7. Seam battens. Oak, ⅜ inch by 2 inch. On the drawing the bottom is planked with three planks about 12 inches wide, which calls for two battens, but narrower planks with more battens may be an advantage.

8. Gunwale strip. Oak, ¼ inch by 1 inch. Fasten with copper rivets passing through the planking and head of frames.

9. Skeg. Oak, ¾ inch thick.

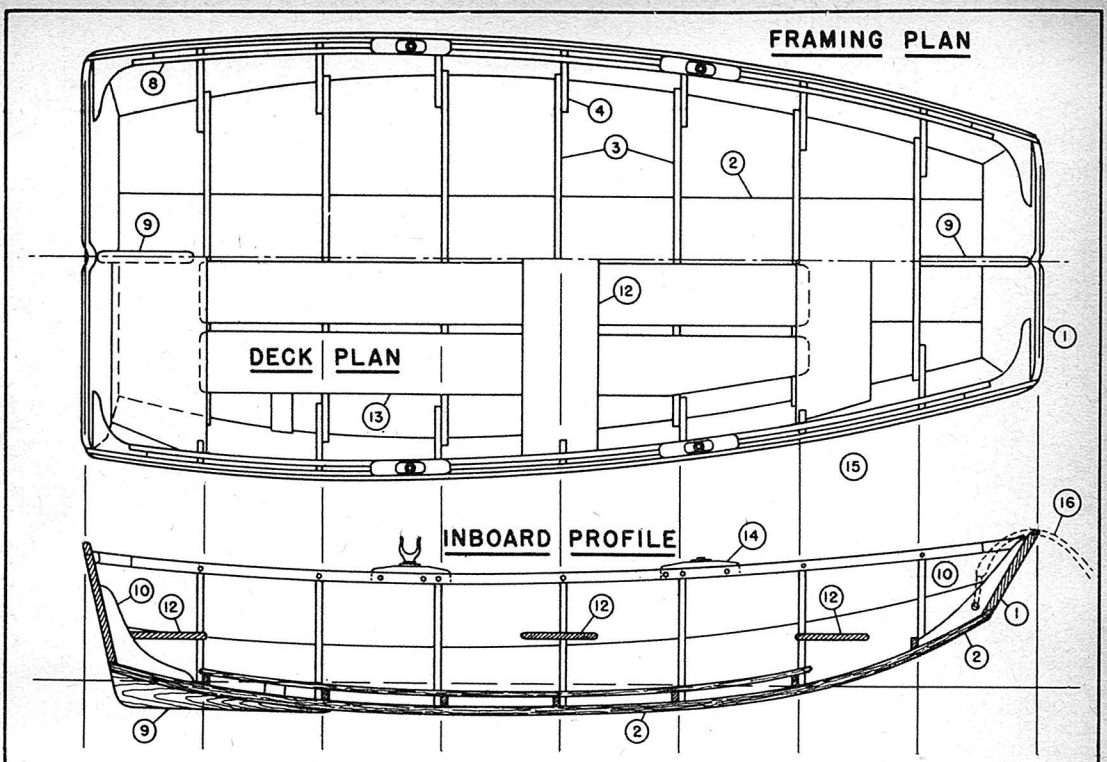
10. Forward and after knees can be of hackmatack or other suitable wood, about 1 inch thick. Forward knee drilled for painter as shown.

11. Quarter knees. Oak or hackmatack, 1 inch thick with some natural crook.

12. Thwarts. ¾-inch spruce.

13. Floor boards, ½-inch spruce, pine or fir.

14. Rowlocks, etc. Where the rowlocks

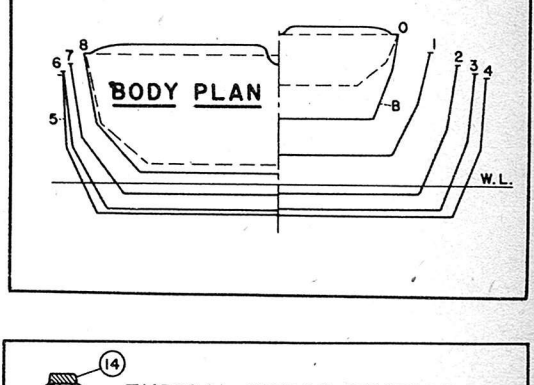


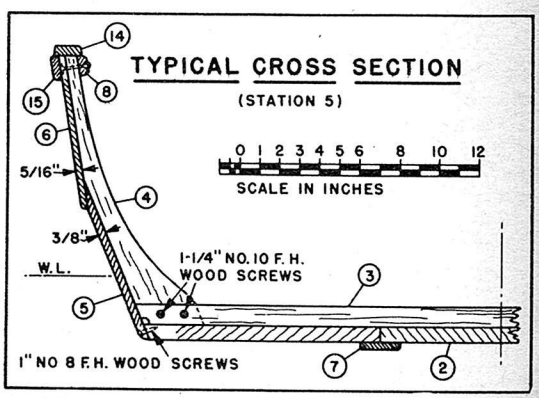
come there should be pieces of oak between the planking and the gunwale strap, with a block above about 8 by 1⅜ by ½ inches, as shown on section 5.

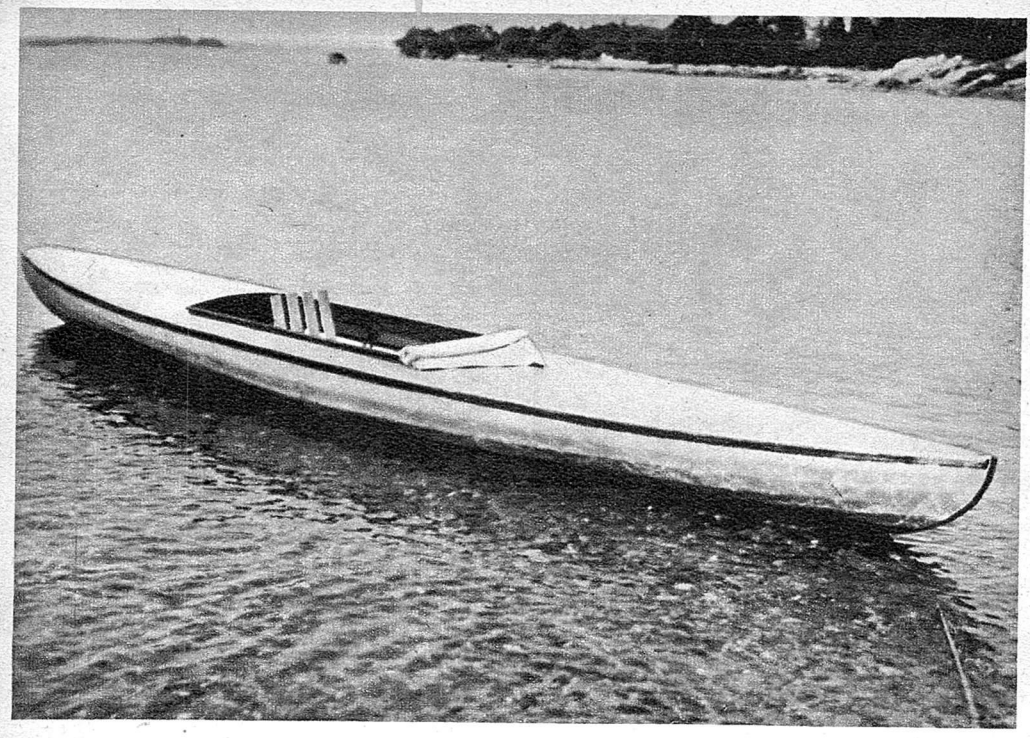
15. Chafing strip. Oak or spruce, about ⅜ by 1¼ inch.

16. Painter. This dinghy should tow all right with the painter secured inside; it is shown spliced into the bow knee. If the painter runs in a notch in the bow and is parceled at that point it should not chafe unduly. The painter should be manila about 1¾-inch circumference, and about four or five fathoms long, but when towing in a seaway a longer rope must be bent to the painter.

Summing up, Nereia is an ideal little pram of surprising versatility. The time spent in the building of Nereia will be amply returned in boating pleasure. •







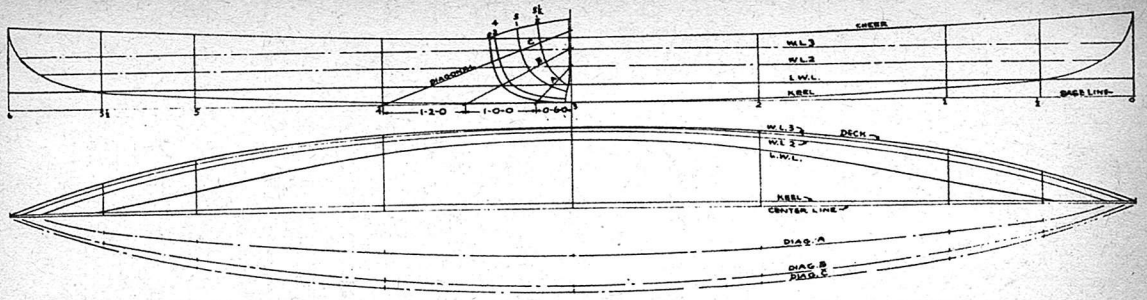
SEAL

There's adventure in every inch of this 16-foot Eskimo kayak.

HERE are the building plans for a kayak based on the general lines of the canoes used by the Eskimos. Seal is essentially a one-man boat but she may be made longer and the cockpit lengthened out a little so that two persons may be accommodated. This may be accomplished by respacing the frames about three or four inches farther apart than shown.

The lines should be laid down on the floor, full size and carefully faired up. There are always slight errors which are certain to creep in on any offset table and corrections can be made only from the full-sized plans. Make an exact duplicate of the lines to full-size scale. It is best to make this drawing on a smooth, level floor, setting down first the baseline and the centerline. Then comes the locations of the frames and finally, by referring to the offset table, the body plan or sections. Each section should be drawn in and faired up by working on the waterlines and the diagonals. The offset table is not complicated and simply represents a series of dimensions given in feet, inches and eighths. In the offsets the first number in each group of three represents feet, the second inches and the third eighths of an inch. Thus the dimension 1-1-1 means one foot, one inch and one eighth of an inch. The dimension 0-2-7 means two and seven eighths inches and so on. Study the thing and you will have no difficulty at all.

Suppose we have the drawing made full size on the floor. We want to make frame ½ and frame 5½. Both are exact duplicates. We take our material for frame ½ which should be ½ inch thick by about 12 inches wide by about 14 inches deep. First, drive a row of little brads around the outline of frame ½ in the full-sized drawing. These brads are driven in about halfway and then the frame material laid on top of them and by tapping the wood with a hammer or by treading lightly on it, each brad will leave an impression in the frame material. Connect these up with a fair curve and saw off the excess material. We then take the material, turn it over, carefully line it up on the centerline and repeat the process. This gives us the shape



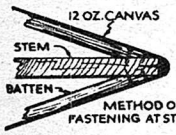
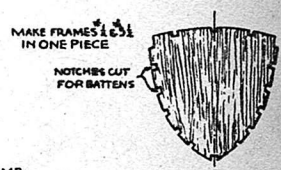
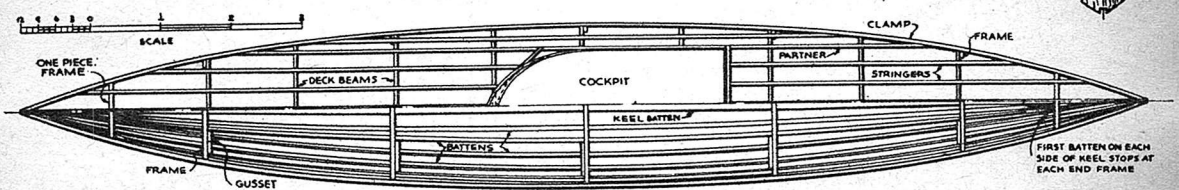
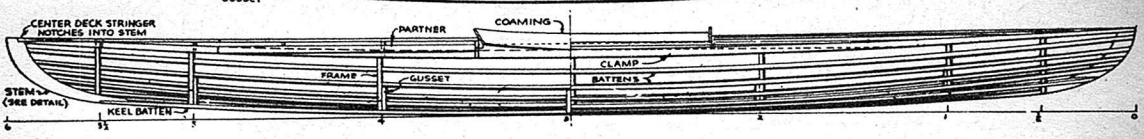


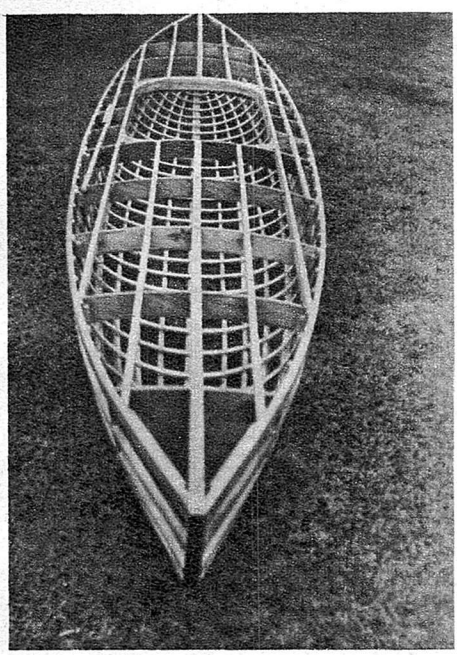
TABLE OF OFFSETS

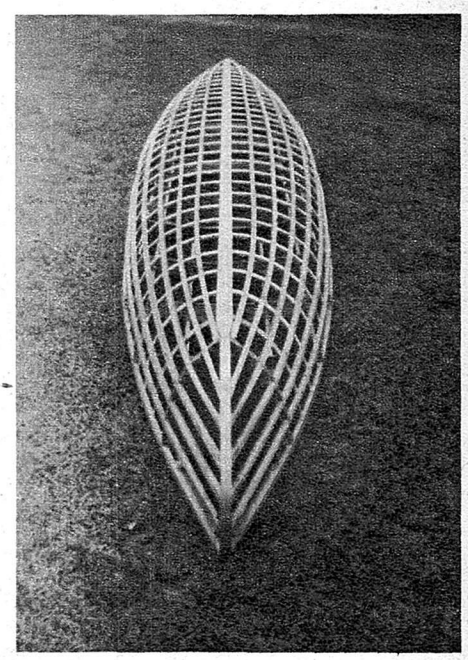
STATION	HEIGHTS TO		HALF BREADTHS TO						
	KEEL	SHEER	L.W.L.	W.L. 2	W.L. 3	DECK	DIAG. A	DIAG. B	DIAG. C
0 & 6	——	1-2-0	——	——	——	——	——	——	——
½ & 5½	0-2-7	1-1-1	0-0-6	0-3-6	0-4-7	0-5-4	0-3-7	0-4-5	0-5-4
1 & 5	0-1-6	1-0-3	0-3-5	0-7-3	0-8-4	0-9-1	0-4-5	0-7-6	0-9-0
2 & 4	0-0-4	0-11-2	0-9-6	0-11-5	1-0-4	1-0-7	0-6-7	0-11-5	1-0-7
3	0-0-0	0-11-0	0-11-4	1-1-0	1-1-4	1-1-6	0-7-6	1-1-0	1-2-1



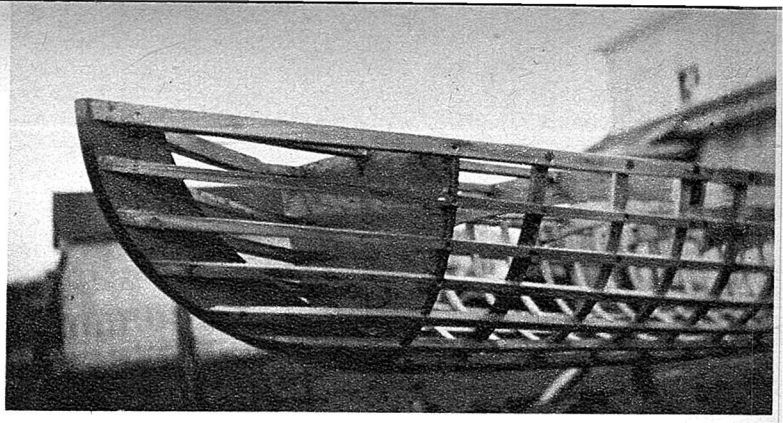




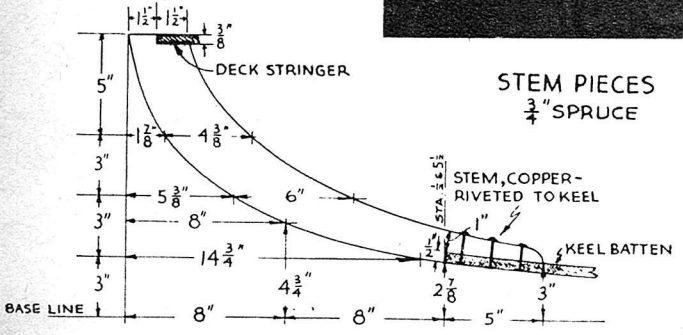


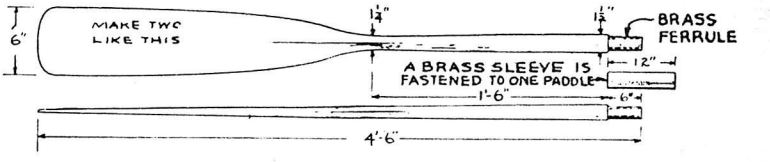


Two views of the framed-out kayak. Before covering with canvas, carefully check the frame for rough spots. Sand them down, round off all edges that could cut the canvas skin, then varnish the entire frame.



The stem piece is riveted fast to the keel batten and the battens are screwed to the stem piece.





of both sides and our first frame is completed. The camber of the deck may also be cut in after the same method. Two of these frames are made, one for each end of the boat.

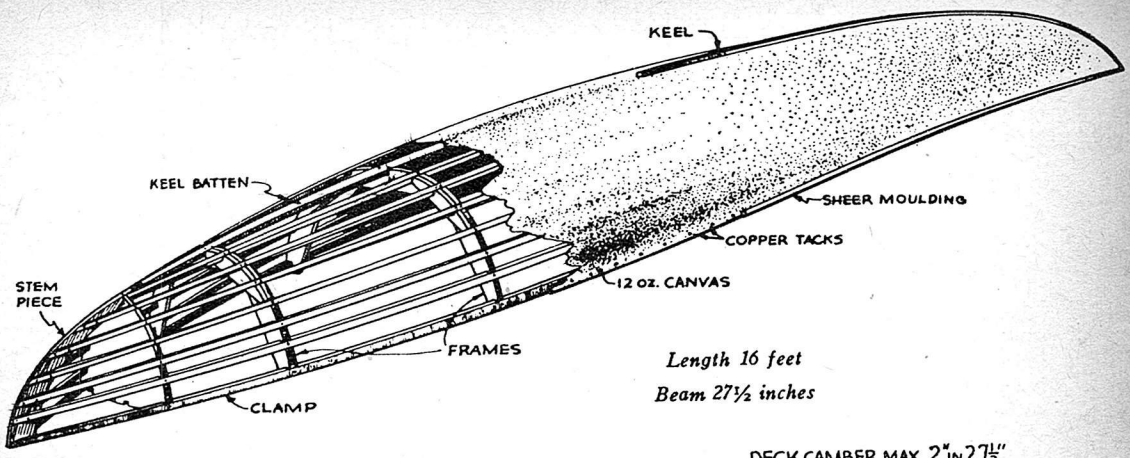
Make frames 1, 2, 3, 4 and 5 along the same manner but these frames we find are built up from several pieces and not solid like the little end frames. There is one piece across the bottom, two pieces forming the sides and a piece at the corner forming a gusset to hold the other pieces together.

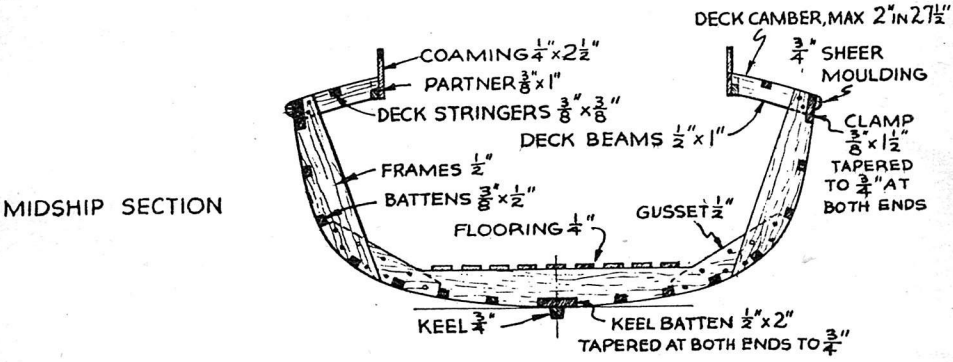
When the various parts are cut to shape, they may be laid down on the floor right on top of the drawing, fitted and fastened together with the gussets which may be screwed or riveted together, but be sure that there is no give anywhere in the structure. Frames 1, 2, 4 and 5 should have the deck beam piece across the top as soon as finished. Frame 3 should have a temporary piece across it which should not be removed until everything is in place and the boat ready to be covered.

Next, get out the keel batten to the size required and then set up a series of blocks on the floor, each of a height to give the proper curve to the bottom of the keel. These heights may be secured from the table of offsets. Of course, you may reverse the whole process and build the boat upside down using a piece of tightly stretched wire overhead as the baseline and taking all dimensions down instead of up. This method is a lot simpler.

At any rate, set up the keel and fasten it to the blocks so that it has the proper curve from end to end. Then make the stem and stern pieces, which are exactly alike, and rivet these fast to the ends of the keel batten. Note that the keel batten is tapered from end to end. Next, mark off accurately the exact locations of the various frames. Put frame 3 in place and then the others. First get in the clamp piece which is notched into the frame right up at the sheer. Fasten this in place, starting with the 'midship frame and then working out toward the ends. It is advisable, in order to equalize strains, to work both clamps into place at the same time.

Now, divide up each frame into an equal number of parts so that there will be six battens on each side. Note, however, that the lowest batten does not go any further forward than frame ½, nor aft beyond frame 5½. Cut notches in each frame so that the battens will set in flush with the





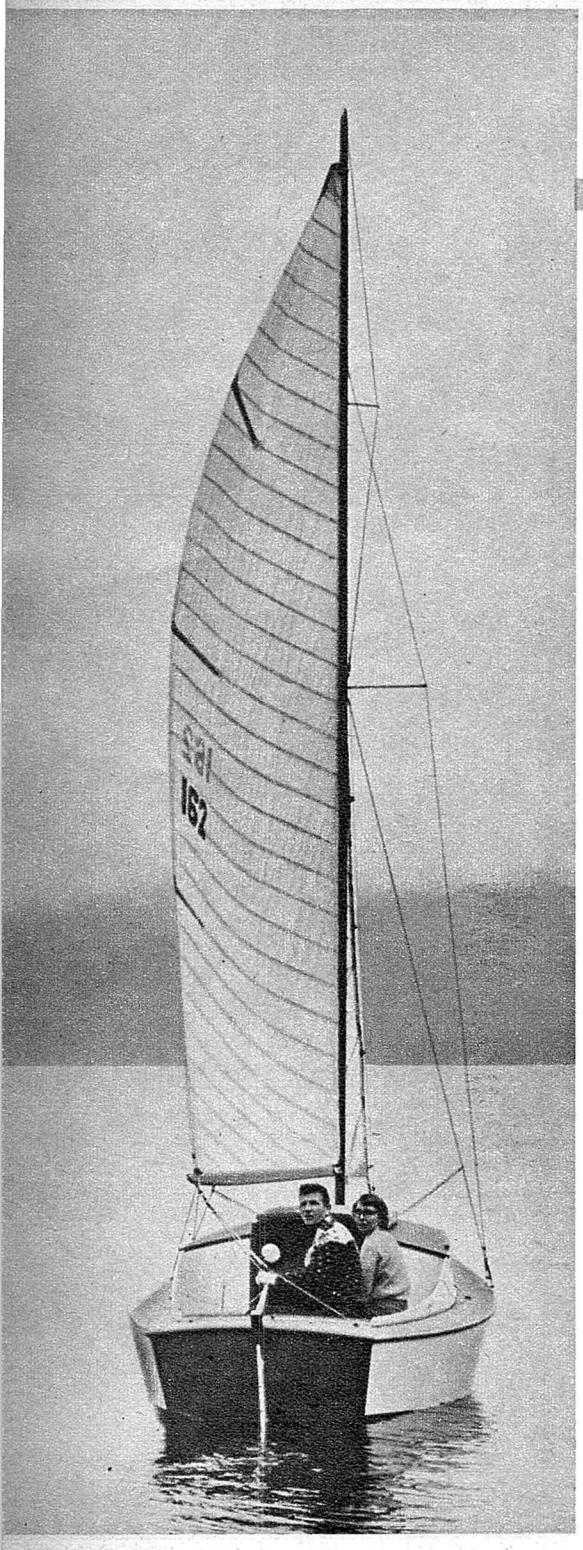
MIDSHIP SECTION

outside of the frame. Each batten should be a fairly tight fit and should be screwed or nailed to the frame. Note from the drawings how these battens are brought into the stem and stern pieces and screwed fast.

You now work the center deck stringer from bow to stern. Note that it is notched into the stem and stern pieces flush. It is also notched into each deck beam, as are the other deck stringers. They are divided up so that there will be four on each side. They do not follow the side of the deck but run straight fore and aft until they come to the inside of the clamp where they are beveled off to fit snugly and then fastened in place. Run each one through and when all are complete, cut away for the cockpit, putting in the headers as shown. The cockpit may be any shape but don't make it any larger than shown.

The boat is now ready for the canvas. Put it on in one piece from sheer to sheer and tack along the outside of the clamp. This line of tacks will later on be covered with the sheer molding. The decking should be put on in one piece also, from sheer to sheer. All the canvas should be put on soaking wet; when you are about ready for it, put the whole business in the family washtubs and let the canvas soak up all the water possible. Tack it in place while still wet and when it dries it will be as tight as the proverbial drum. It would be advisable to smear the outside of the clamp and the outside of the keel batten with marine glue before the canvas is applied, setting the canvas into this so that there is no danger of a leak at these points.

Outside of putting on the coaming and the flooring and painting, the kayak is now complete. In painting do not put the paint on too thick. Several thin coats are much better than one or two thick ones. Thick paint makes cracks. Give it at least three or four coats, lightly sanding down between each coat when dry. Wind up with a coat of regular canoe enamel. Colors are, of course, optional. A kayak should not be in the water except when being used. •



BONNIE II

BACK in 1940, the boating editor of MECHANIX ILLUSTRATED undertook to design and build a boat to meet the requirements of a majority of readers. It seems that practically everybody wanted a boat with an engine and a vast majority liked sailing, so it was quickly settled that the boat should have both sail and power. Then, too, most people wanted a boat of moderate size and ample beam with a roomy cockpit for fishing and a comfortable cabin for overnight trips; shallow draft was desired, so that a dinghy would not be needed and the boat might be beached if necessary; V-bottom hulls were first choice because of their seaworthiness and ease of construction; a fair turn of speed was wanted, both under sail and power; and last, but far from least, the boat had to be well built at moderate cost. How well the designer met the requirements is evidenced by the continued popularity of the original Bonnie.

Some fourteen years later, Dick Donohue, of Seattle, Wash., bought a set of plans. Before he got around to building, he had the opportunity to buy a second-hand set of sails, mast, boom and rigging from a Mercury Class boat. Knowing that Bonnie's sail area, about 165 sq. ft., was very close to that of a Mercury, he decided that with some careful figuring he could adapt the plans and come up with a workable design. Other changes were incorporated, mostly because of a desire to reduce the costs even more than in the original Bonnie. The result, a lighter boat with a new sail plan, which was built for the low cost of $403, is now presented anew as Bonnie II.

The first step is to cut three 20-foot pieces from a roll of building paper, lay the pieces flat on the floor and paste them together with rubber cement or other adhesive to make one large sheet 20 by about 8½ feet. Paste up another sheet to a 5x8-foot size. Spread out these big sheets on the floor and hold down the edges with anything handy. With a chalked string, snap down centerlines and base lines and accurately transfer the profile to the larger of the two sheets—the body plan to the smaller. A long, straight rule, a couple of

flexible battens and a black pencil will be needed for this. Measure off the frame stations along the centerline and draw a line to indicate each one, at exact right angles to center and base lines. Draw the plan of the boat just as it will actually be, taking halfwidth and height measurements from the offset table, spotting them on your drawing and connecting them up with pencil lines. It is only necessary to draw half the boat in plan view.

Having completed the full-size drawings, you are ready to cut the frames, gussets, keel, keelson, stem, transom and knees. You will note that the offsets are given to the inside of the planking, so there is no need to make allowance for the thickness of the latter, all frames being matched up right to the line on the body plan. Spread the body plan on the floor, with the base line at the top, take measurements of frame sides and bottoms, as well as the angles at keel and chine, and saw out the 24 frame pieces (4 pieces to each of the 6 frames). Be sure to extend the side pieces clear up to the base line. This causes the frames to automatically assume the correct shape of the bottom when they are placed upside down on the building frame. After the hull has been planked and turned over, these extra lengths will be trimmed off at the sheer. As you finish cutting each frame, place it on top of the body plan at its station for a final checkup. Don't forget to mark the station number on each piece of frame to avoid a mixup when assembling.

Next step is to cut the gussets (the angular pieces that tie the frames together) from ⅜-in. fir plywood. The simplest and most accurate procedure is to lay a large sheet of tracing paper over the body plan and trace off the angle at the chine and sheer of each frame. Mark the outside line of each gusset 8 in. along the side and bottom of each frame, then at right angles across the thickness of the frame. A diagonal line from the two points thus established completes the shape of each gusset. Use the same procedure for the floor beams, allowing these to extend 14 in. or more along the frame bottoms. The outlines may now be transferred by means of carbon paper directly to the fir plywood.

Place the frame pieces, starting with No. 1, on the floor in their assembled position and coat with red lead the joints and places where gussets and floor beams will cover. While the paint is wet, clamp the gussets and floor beams to the frames, fastening in place with 1½-in. No. 10 flathead brass screws. When all have been completed, crossties of scrap lumber are fastened flush across the open ends or tops of the frames. The six assembled frames may be laid aside until needed.

The three parts of the stem are cut from one piece of mahogany, 6x3 in. x 6 ft. long. Mark the three sections accurately on the wood from the full-sized drawing previously made. After they have been cut out mark the taper at the front edge, using the cross-section drawing as a guide. Clamp each piece to the workbench and trim with a drawknife, smoothing off with a jack plane. The piece at the bottom has very little taper, being practically flat where it runs into the keel. Place the stem pieces on the floor and fit them together. The lock scarphs should fit snugly, and the whole go together like pieces in a jigsaw puzzle. Take the stem apart, paint the joints with red lead, reassemble and bolt together with bronze or galvanized carriage bolts of the sizes indicated in the bill of materials. Countersink the heads in the outside of the stem. If the boat is to be used in salt water it is best to employ bronze and brass fastenings throughout, as these will materially add to the life and value of the boat and be well worth their extra cost. The stem may now be roughly rabbeted with mallet and chisel, or you may wait and cut the rabbet after the framework has been set up. Note that the stem must be rabbeted to take the ⅜-in. side and bottom planking. The stem must also be notched for chines and sheer strips, but this, too, is best done later on.

The transom, transom frame and knee come next. Mahogany planks, 8 in. x ¾ in. thick, are glued up and used for the transom itself. Cut to the shape and dimensions indicated. Assemble ¾x3-in. mahogany transom frame on the transom, fastening

NOTE:
FOR AUXILIARY POWER BRIGGS & STRATTON 2-1/2 HP. AIR COOLED 4 CYCLE CYLINDER ENGINE WITH 2:1 BELT DRIVEN REDUCTION GEAR.

1/8" DIA. STAINLESS STEEL WIRE IN ALL STANDING RIGGING.

— OFFSET TABLES —

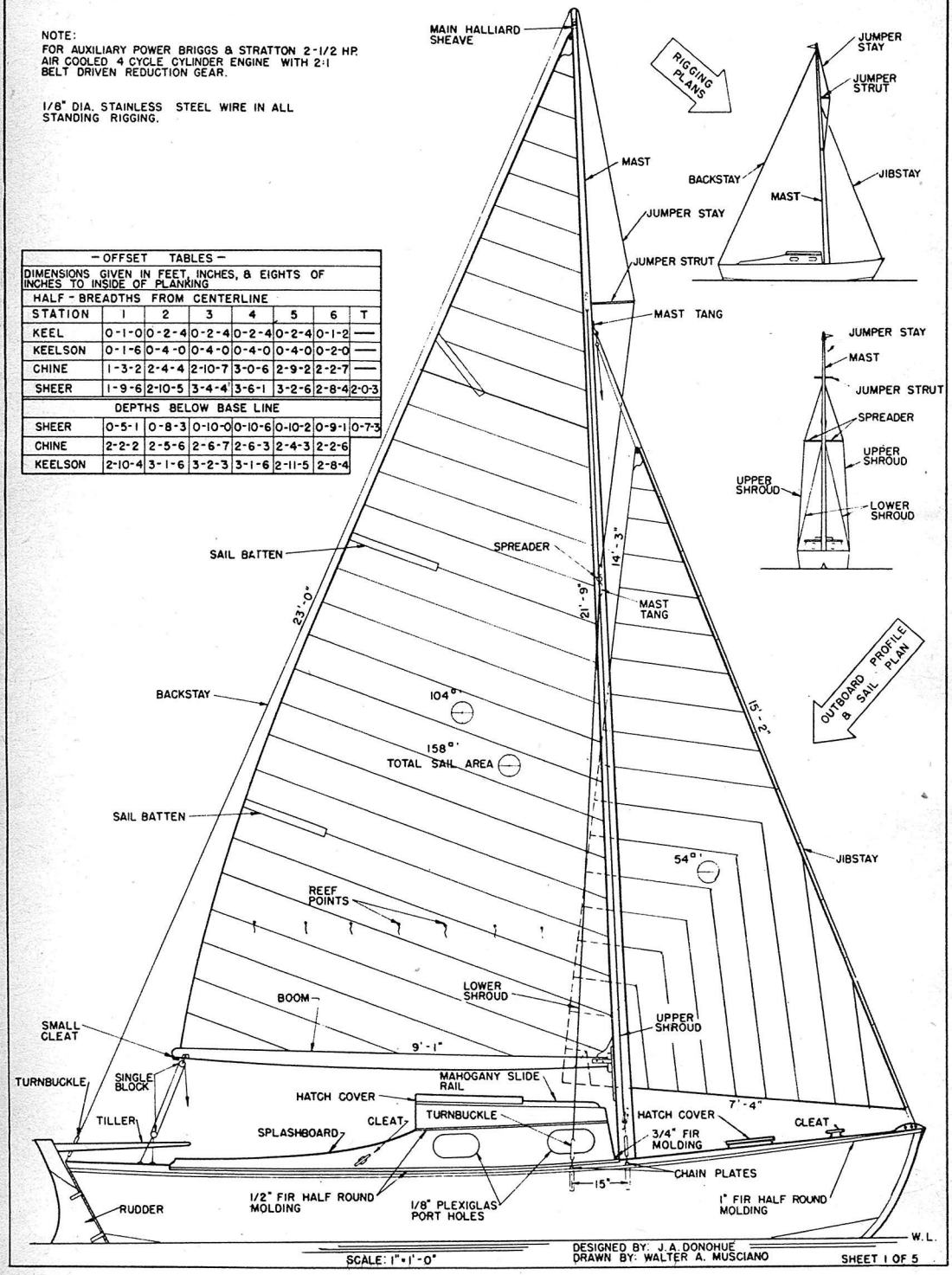
DIMENSIONS GIVEN IN FEET, INCHES, & EIGHTS OF INCHES TO INSIDE OF PLANKING

HALF - BREADTHS FROM CENTERLINE

STATION	1	2	3	4	5	6	T
KEEL	0-1-0	0-2-4	0-2-4	0-2-4	0-2-4	0-1-2	—
KEELSON	0-1-6	0-4-0	0-4-0	0-4-0	0-4-0	0-2-0	—
CHINE	1-3-2	2-4-4	2-10-7	3-0-6	2-9-2	2-2-7	—
SHEER	1-9-6	2-10-5	3-4-4	3-6-1	3-2-6	2-8-4	2-0-3

DEPTHS BELOW BASE LINE

SHEER	0-5-1	0-8-3	0-10-0	0-10-6	0-10-2	0-9-1	0-7-3
CHINE	2-2-2	2-5-6	2-6-7	2-6-3	2-4-3	2-2-6	
KEELSON	2-10-4	3-1-6	3-2-3	3-1-6	2-11-5	2-8-4	



SCALE: 1"=1'-0"

DESIGNED BY: J.A. DONOHUE
DRAWN BY: WALTER A. MUSCIANO

SHEET 1 OF 5

with 1½-in. No. 10 flathead brass screws. Allow about a half inch of transom frame to project out over the sides and bottom of the transom; this takes care of the bevel for the planking later on. Mark the outlines of the transom knee accurately on a piece of 2x7¾-in. x 3-ft. mahogany and band-saw to shape. Fasten the knee to the exact center of the transom ⅝ in. above the bottom edge with $\frac{5}{16}$-in. carriage bolts run through from the outside with heads countersunk. The ⅝-in. clearance allows a notch to be cut in the transom frame to receive the end of the keel.

The 16-ft. lengths of oak and Alaskan cedar which become keel and keelson must be tapered from station 2 forward and from station 5 aft. Next cut out the centerboard slots, using care to get them both alike. You will have found that the 16-ft. planks are a bit too long—they should be trimmed to exact length at the forward ends and allowed to lap over aft.

Now, set up the building frame. Obtain two cheap but straight 2x6's, 18 ft. long. Place them parallel on edge about 30 in. apart. Take care to have them exactly level. Nail scrap lumber across the ends with heavy galvanized nails, and fasten three or four cross braces in between to give a very rigid assembly. Give the frame a final check for level and run a strong cord along the exact center from end to end, pulling it taut and tacking securely.

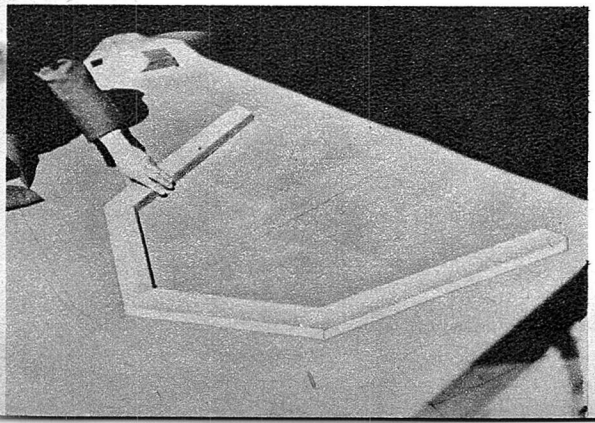
Bring out the six completed frames and mark a center line on each crosstie. Cut a notch the width of the keelson and ⅝ in. deep in the bottom of every frame. Bevel these notches so the keelson will fit perfectly flat in each one despite this curve; the bevels can be taken from the profile drawing or determined by setting the frames up temporarily and running a batten across the bottoms. In any case, cut the notches carefully and set the frames on top of the building frame, after first marking station lines on the latter. Frames 1, 2 and 3 must be placed just forward of the station lines, and 4, 5 and 6 just aft of their station lines. In other words, the aft edges of the mahogany parts (not the crossties) of frames 1, 2 and 3 should be the station lines, and the forward edges of 4, 5 and 6 must do likewise. Drop a plumb line from each frame before finally bracing it in position. After all frames have been securely braced in their correct positions and crossties nailed to building frame you are ready to bend in the keelson and keel.

First lay the keelson in its notches and bend it down to frames 1 and 6, clamping it at those points. Place the keel on top of the keelson, bend it down and clamp. Two $\frac{5}{16}$-in. carriage bolts are run through keel, keelson and frame, with heads countersunk in the keel at each frame except frame 1, where only one bolt is used. A filler block is placed in the V at this frame, through which the bolt is fastened.

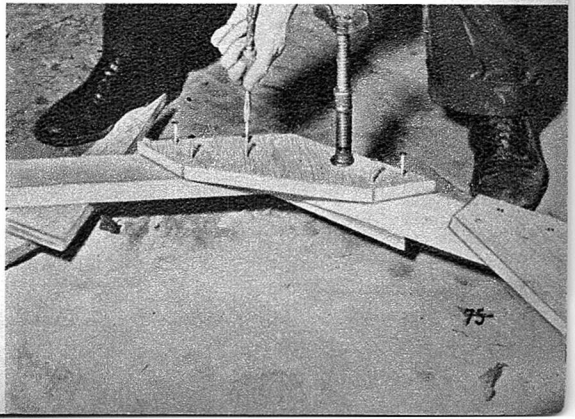
The transom with its attached knee is next set up in position on the building frame. The keel and keelson may now be trimmed until, when pulled down flush with the knee, they are just even with the outside of the transom. Notch the transom frame ⅝-in. deep for the keelson, and rasp the end of the latter until it seats nicely in the notch. Fasten with carriage bolts in the same manner as the frames. The stem can now be bolted temporarily in position with two long carriage bolts.

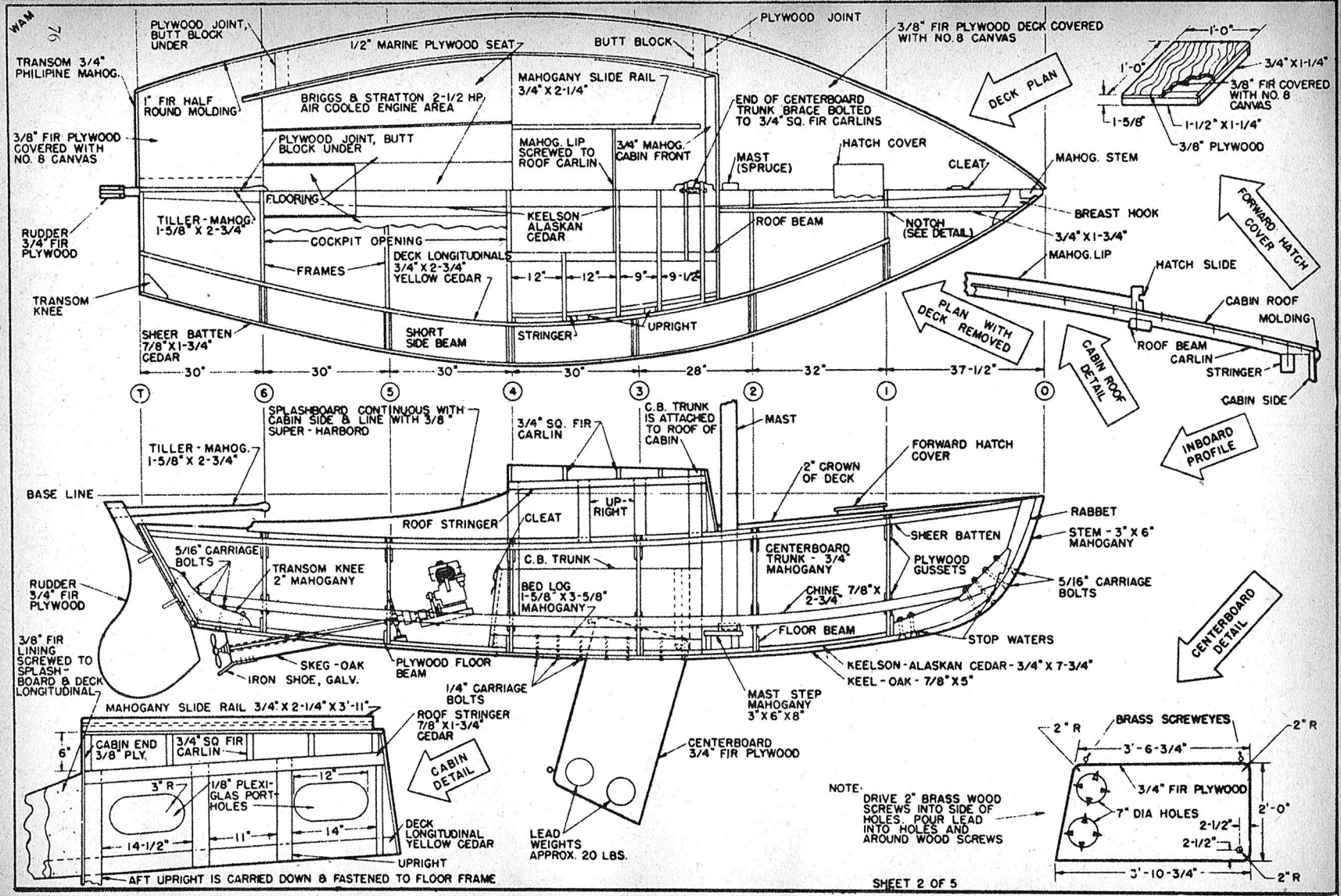
The framework has now become a rather rigid unit, but nothing compared to what it will be after chines and sheer battens have been put in. The former consist of two pieces of yellow cedar ⅞x2¾ in. x 18 ft. long. The sheer strips are somewhat smaller, being ⅞x1¾ in. x 19 ft. long. Notches must be cut in the frames to accommodate these pieces. First cut the chine notches, allowing the chine to fit even with the side angle of the frames and

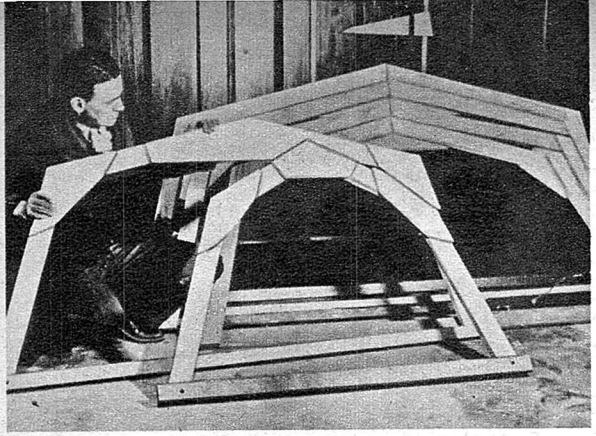
Before starting the final assembly of frames, check for accuracy on the full-size body plan.



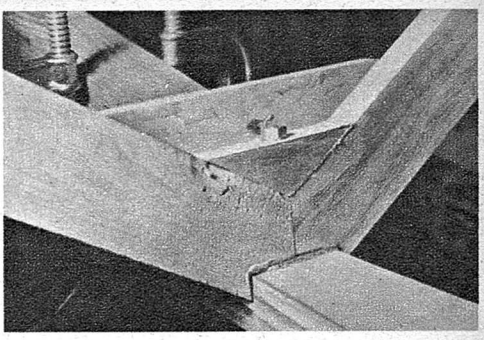
Complete each frame by laying gussets and floor beams in wet red lead; secure with brass screws.




WAM 76
PLYWOOD JOINT, BUTT BLOCK UNDER
1/2" MARINE PLYWOOD SEAT
BUTT BLOCK
PLYWOOD JOINT
3/8" FIR PLYWOOD DECK COVERED WITH NO. 8 CANVAS
TRANSOM 3/4" PHILIPINE MAHOG.
1" FIR HALF ROUND MOLDING
BRIGGS & STRATTON 2-1/2 HP AIR COOLED ENGINE AREA
MAHOGANY SLIDE RAIL 3/4" X 2-1/4"
END OF CENTERBOARD TRUNK BRACE BOLTED TO 3/4" SQ. FIR CARLINS
DECK PLAN
1'-0"
1'-0"
3/4" X 1-1/4"
3/8" FIR COVERED WITH NO. 8 CANVAS
1-5/8"
1-1/2" X 1-1/4"
3/8" PLYWOOD
3/8" FIR PLYWOOD COVERED WITH NO. 8 CANVAS
PLYWOOD JOINT, BUTT BLOCK UNDER
MAHOG. LIP SCREWED TO ROOF CARLIN
3/4" MAHOG. CABIN FRONT
MAST (SPRUCE)
HATCH COVER
CLEAT
MAHOG. STEM
FLOORING
TILLER - MAHOG. 1-5/8" X 2-3/4"
KEELSON ALASKAN CEDAR
ROOF BEAM
NOTCH (SEE DETAIL)
BREAST HOOK
3/4" X 1-3/4"
RUDDER 3/4" FIR PLYWOOD
COCKPIT OPENING
FRAMES
DECK LONGITUDINALS 3/4" X 2-3/4" YELLOW CEDAR
12"
12"
9"
9-1/2"
FORWARD COVER HATCH
MAHOG. LIP
HATCH SLIDE
TRANSOM KNEE
PLAN WITH DECK REMOVED
CABIN ROOF
MOLDING
ROOF BEAM
CARLIN
STRINGER
CABIN SIDE
CABIN ROOF DETAIL
SHEER BATTEN 7/8" X 1-3/4" CEDAR
SHORT SIDE BEAM
STRINGER
UPRIGHT
30"
30"
30"
30"
28"
32"
37-1/2"
T
6
5
4
3
2
1
0
SPLASHBOARD CONTINUOUS WITH CABIN SIDE & LINE WITH 3/8" SUPER-HARBORD
3/4" SQ. FIR CARLIN
C.B. TRUNK IS ATTACHED TO ROOF OF CABIN
MAST
INBOARD PROFILE
TILLER - MAHOG. 1-5/8" X 2-3/4"
FORWARD HATCH COVER
2" CROWN OF DECK
BASE LINE
ROOF STRINGER
CLEAT
UP-RIGHT
RABBET
STEM - 3" X 6" MAHOGANY
SHEER BATTEN
5/16" CARRIAGE BOLTS
TRANSOM KNEE 2" MAHOGANY
C.B. TRUNK
CENTERBOARD TRUNK - 3/4" MAHOGANY
PLYWOOD GUSSETS
RUDDER 3/4" FIR PLYWOOD
BED LOG 1-5/8" X 3-5/8" MAHOGANY
CHINE 7/8" X 2-3/4"
5/16" CARRIAGE BOLTS
FLOOR BEAM
STOP WATERS
3/8" FIR LINING SCREWED TO SPLASH-BOARD & DECK LONGITUDINAL
SKEG - OAK
IRON SHOE, GALV.
PLYWOOD FLOOR BEAM
KEELSON - ALASKAN CEDAR - 3/4" X 7-3/4"
KEEL - OAK - 7/8" X 5"
CENTERBOARD DETAIL
1/4" CARRIAGE BOLTS
MAST STEP MAHOGANY 3" X 6" X 8"
MAHOGANY SLIDE RAIL 3/4" X 2-1/4" X 3'-11"
ROOF STRINGER 7/8" X 1-3/4" CEDAR
CABIN DETAIL
6"
CABIN END 3/8" PLY.
3/4" SQ FIR CARLIN
3" R
1/8" PLEXI-GLAS PORT HOLES
12"
14"
11"
14-1/2"
DECK LONGITUDINAL YELLOW CEDAR
UPRIGHT
CENTERBOARD 3/4" FIR PLYWOOD
LEAD WEIGHTS APPROX. 20 LBS.
AFT UPRIGHT IS CARRIED DOWN & FASTENED TO FLOOR FRAME
NOTE: DRIVE 2" BRASS WOOD SCREWS INTO SIDE OF HOLES. POUR LEAD INTO HOLES AND AROUND WOOD SCREWS
2" R
BRASS SCREWEYES
2" R
3'-6-3/4"
3/4" FIR PLYWOOD
7" DIA HOLES
2'-0"
2-1/2"
2-1/2"
3'-10-3/4"
2" R



Scrap-lumber crossties are nailed flush across the tops or open ends of the completed frames.



Filler block, glued in Frame 1, anchors carriage bolt running through keel, keelson and frame.

project slightly beyond the bottom, to be beveled flush after fastening. The fore and aft bevel can be obtained by bending a long, light batten around the sides of the frames and marking the angle on each. After the notches, including one in the transom frame, have been cut, bend in the chines and fasten with two 2-in. No. 10 flathead brass screws into each frame. Mark off the sheer line on the frames, cut notches and bend in the sheer battens.

The next task is to bevel all the frames, sides and bottom, until a continuous smooth surface with no corners or edges is attained, on which the planking will fit like a glove. The transom, of course, must also be beveled, as well as the keelson.

Now unbolt the stem and roughly chisel out the rabbet, following the cross section drawing. Cut the notches for the chines and sheer strips deep enough so that the ends of these pieces will fit flush into them, the outsides level with the planking rabbet. Replace the stem, tightening the bolts and fastening the ends of chine and sheer pieces in their notches with 2-in. No. 10 screws. Check the rough rabbet with a strip of wood several inches wide and 5 or 6 ft. long. Lay the wood along the frames near the bow, clamp it and bend the end down into the rabbet. Do this at intervals, trimming the rabbet as you go, until the plank fits neatly into the rabbet everywhere.

In planking Bonnie II, the sides are covered first, two pieces to each. Get out your roll of building paper and make two patterns for the side; a full 12-ft. one and another to cover the rest of the length. On one side use the short piece at the bow, on the other side at the stern, thus staggering the joints. Allow the pattern to come about ¼ in. above the chine and below the sheer. Place the patterns on the ⅜-in. plywood sheets and pencil around them. Cut out the panels and clamp them in place on the sides. Drill holes for 1¼-in. No. 8 flathead brass screws; 5 in. on centers along frames and sheer; 3 in. on centers at chine and stem. Take marine glue and swab it plentifully along the chine, stem and transom. Coat also the corresponding edges of the panels, on the underside only. Now take strips of cotton flannel (torn into 3-in. wide strips) and lay them along the gluey chine, stem and transom. Replace the panels with clamps, and turn in the screws until they are just below the surface of the plywood. When all pieces are on tight plane the edge that projects below the chine until it is beveled even with the latter. Follow the same procedure to plank the bottom, placing flannel and glue along keel, chine, stem and transom. It will be necessary, however, in the case of the bottom to put short panels at the bow, as a 12-ft. length is too hard to manipulate into the stem. Put in the bow panels first, clamping the aft ends to keelson and chine, then working the forward ends gradually down to the stem. When the panel has been forced to the stem put in several screws quickly to hold it. The two long bottom panels will go on as easily as the side pieces. Space the screws at 2 in. on centers along the keel and stem, 3 in. along the chine and transom, 4 in. on the frames.

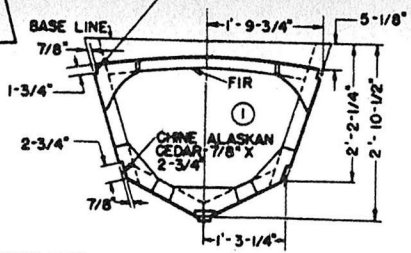
Bevel the edges of the bottom planking until they are flush with the sides and transom. Butt blocks may be put in at this time. Set the butt blocks in flannel and marine glue, fastening with double rows of screws spaced at 3-in. intervals.

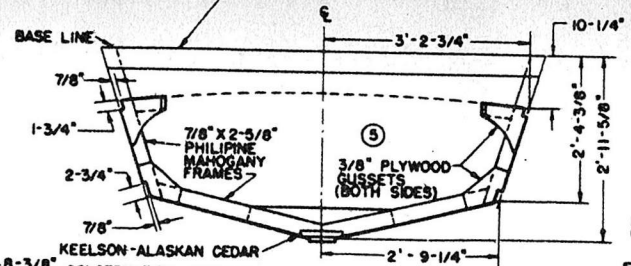
Next, cover all screw heads with Kuhl's trowel cement and fill the seams along keel, stem and butt joints with elastic seam compound. Sand the bottom smooth and apply two coats of copper bottom paint,

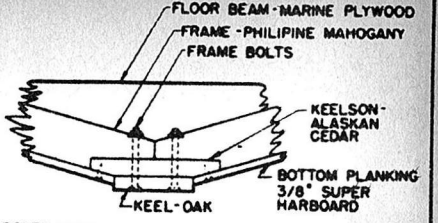
WAM 78

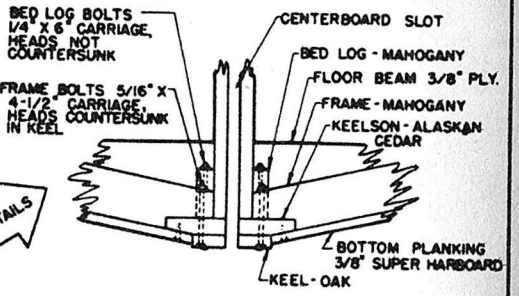
FRAMES

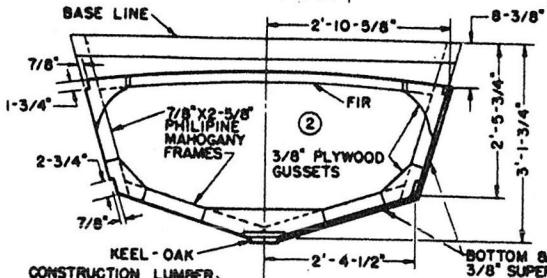
NOTE: CONSTRUCT ALL FRAMES TO BASE LINE AS SHOWN. CUT OFF EXCESS FRAMING AFTER HULL STRUCTURE IS ASSEMBLED.

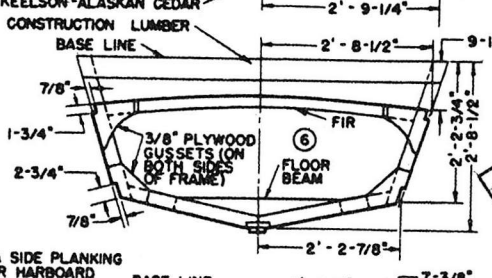




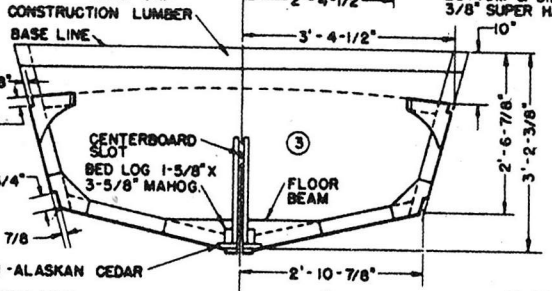


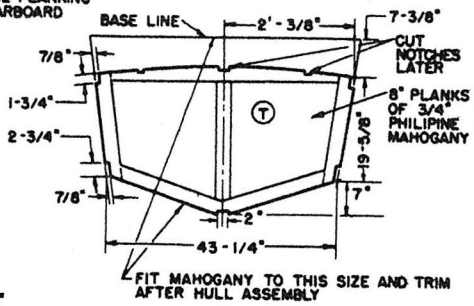






FRAME DETAILS

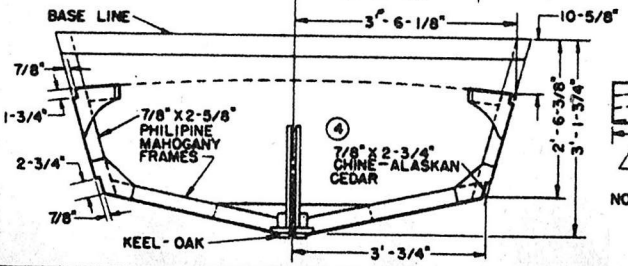


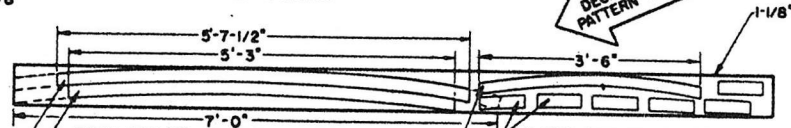


FIT MAHOGANY TO THIS SIZE AND TRIM AFTER HULL ASSEMBLY

FASTENING CHART

GUSSETS, ETC. TO FRAMES - 1-1/2" NO. 10 FL. HD. SCREWS	DECK FRAMING - 1-1/4" NO. 8 & 1-1/2" NO. 10 FL. HD. AS REQUIRED
CHINES, SHEER STRIPS TO FRAMES - 2" NO. 10 FL. HD.	DECK TO FRAMING - 1-1/4" NO. 10 FL. HD.
TRANSOM FRAME TO TRANSOM - 1-1/2" NO. 10 FL. HD.	CABIN FRAMING - 1-1/4" & 1-1/2" NO. 10 FL. HD. AS REQUIRED
BED LOGS TO C.B. TRUNK - 1-1/2" NO. 10 FL. HD	CABIN ROOF - 1" NO. 8 FL. HD.
PLANKING TO FRAMES, KEEL, CHINES, SHEER STRIPS, STEM - 1-1/4" NO. 8 FL. HD.	COAMINGS, HATCHES, JOINER-WORK, ETC. - 3/4" NO. 8 FL. HD.
	BOLTS, LAG SCREWS, ETC. AS SHOWN & INDICATED IN DRAWINGS & TEXT.
BRASS & BRONZE FASTENING ARE PREFERABLE FOR SALT WATER GALVANIZED FOR FRESH WATER.	

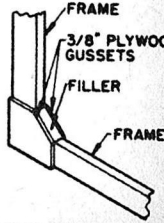




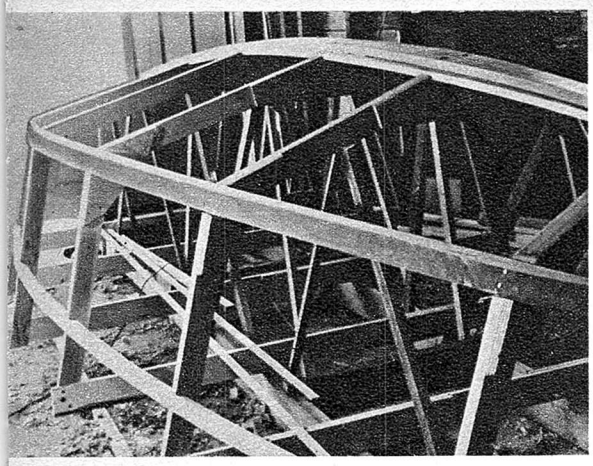
DECK BEAM PATTERN LAYOUT

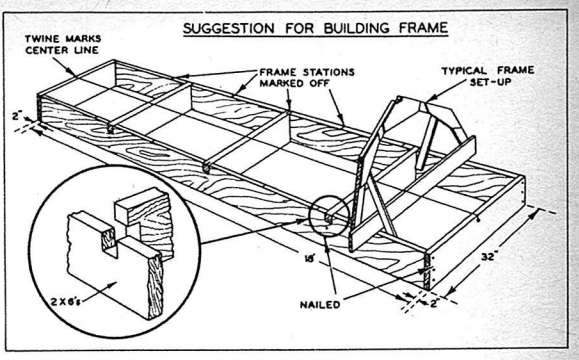
1-1/8" X 5-3/4" X 12'-0" - FIR

NOTE: ALL BEAMS CUT TO SAME CROWN 2" TAKEN AT WIDEST PART OF HULL



GUSSETS DETAIL





Left: with the frames beveled and chines flush with bottom, only the keelson needs beveling.

red, green or bronze, coming just up to the waterline. The boat is ready to be righted and will need a cradle to rest on.

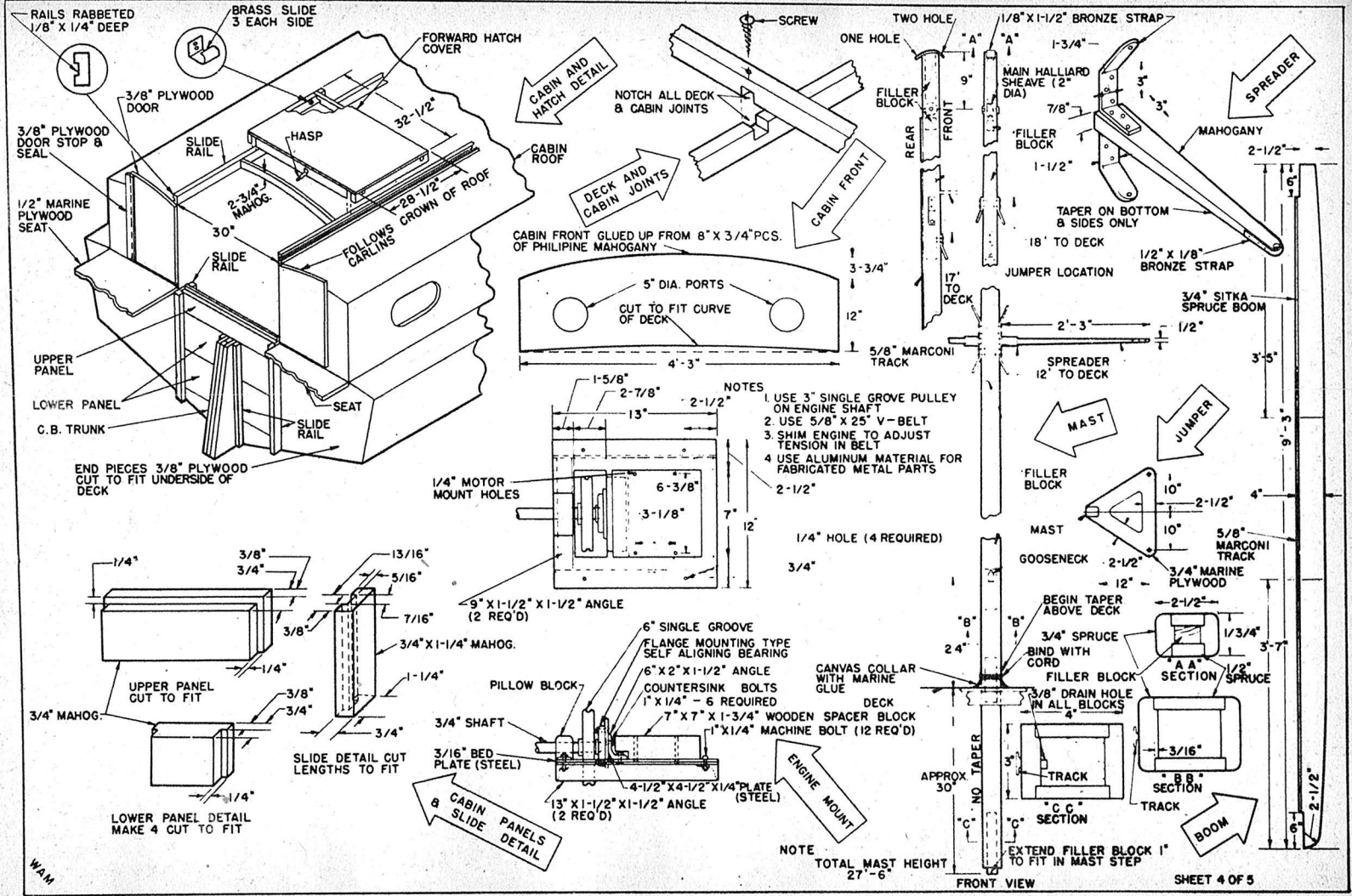
To install the centerboard trunk, cut off the frames and crosspieces extending above the sheer at stations 3 and 4. Then cut away the frames and floor beams on each side of the centerboard slot to accommodate the completed trunk. Next the trunk is completed as shown in the drawing. Be careful in shaping the bottom as it must fit flush on the keelson to be watertight. Paint the inside of the trunk with four coats of bottom paint before it is assembled. Use 1½-in. No. 10 screws to fasten the bed logs to the sides, driving them from plywood through mahogany. Then locate and bore holes through keel, keelson, and bed logs for the hold-down carriage bolts. Cut a gasket to fit over the slot and set it in a liberal quantity of marine glue. Put the trunk sides in position and ram down the end pieces. The forward post must stick up well above the top of the trunk so it can be tied into the cabin roof. Fasten the end pieces in place from both sides of the trunk, using 1¼-in. No. 10 screws. Run the bed log bolts up through from the outside and tighten with nuts and washers from the inside until the glue oozes out. Install the centerboard.

Cut off the remaining projecting frames at the sheer and plane down any edges until flush with the sheer. The ⅜-in. plywood deck beam gussets are now cut. At frames 1, 2, 5, and 6 they can be triangular in shape, extending about 8 inches down the frame sides and 8 inches along the deck beams. Frames 3 and 4 show inside the cabin so you'll want to cut their edges with a graceful curve. Clamp the gussets to the frame tops and fasten with 1½-in. No. 10 screws. The three full-length deck beams and the short side ones are all cut from a 12-ft. plank as shown. The beams are clamped one by one to the gussets, with their outer end butting against the frames, then screwed into place.

Next, bend in the two longitudinals that form the main fore and aft supporting members of the deck and cabin. Notch them into the deck beams and transom frame, and fastened at each deck beam with one screw. Two other longitudinals are run under the fore deck on each side of what will be the hatch. These are notched into the breast hook and frames 1 and 2. The short side beams are notched into the main longitudinal and fastened with one screw at each joint.

The mast pardner, not shown, fits just aft of frame No. 2. It is a 3x3x8-in. block of mahogany. An opening, 3½x4½ inches, is cut out of the center to take the mast, allowing ample room for wedging when the mast is stepped. A small hatch opening is provided just forward of frame No. 1. Three sides are formed; fasten a crosspiece to provide the fourth. Place an upright brace under the deck beam at frame No. 6, securing with screws to the floor beam.

The covering is comprised of six sections: two forward, one on each side and two aft. Three panels of ⅜-in. plywood are used. Make paper patterns of the deck section before cutting the plywood. The plywood is fastened with 1-in. No. 8 flathead brass screws spaced about six inches apart. Butt blocks are placed under the side deck joints and ¾-in. plywood filler pieces back up the joint in the fore deck. The same arrangement is used at the joint in the after deck. Run seam compound in-


RAILS RABBETED 1/8" X 1/4" DEEP
BRASS SLIDE 3 EACH SIDE
FORWARD HATCH COVER
3/8" PLYWOOD DOOR
3/8" PLYWOOD DOOR STOP & SEAL
SLIDE RAIL
HASP
32-1/2"
CABIN ROOF
2-3/4" MAHOG.
28-1/2"
FOLLOWS CROWN OF ROOF
30"
1/2" MARINE PLYWOOD SEAT
SLIDE RAIL
UPPER PANEL
LOWER PANEL
C.B. TRUNK
SEAT
SLIDE RAIL
END PIECES 3/8" PLYWOOD CUT TO FIT UNDERSIDE OF DECK
CABIN AND HATCH DETAIL
SCREW
NOTCH ALL DECK & CABIN JOINTS
DECK AND CABIN JOINTS
CABIN FRONT
CABIN FRONT GLUED UP FROM 8" X 3/4" PCS. OF PHILIPINE MAHOGANY
5" DIA. PORTS
CUT TO FIT CURVE OF DECK
3-3/4"
12"
4'-3"
1-5/8"
2-7/8"
2-1/2"
13"
6-3/8"
3-1/8"
7"
12"
2-1/2"
1/4" MOTOR MOUNT HOLES
9" X 1-1/2" X 1-1/2" ANGLE (2 REQ'D)
NOTES
1. USE 3" SINGLE GROVE PULLEY ON ENGINE SHAFT
2. USE 5/8" X 25" V-BELT
3. SHIM ENGINE TO ADJUST TENSION IN BELT
4. USE ALUMINUM MATERIAL FOR FABRICATED METAL PARTS
1/4" HOLE (4 REQUIRED)
3/4"
1/4"
3/8"
3/4"
UPPER PANEL CUT TO FIT
3/4" MAHOG.
LOWER PANEL DETAIL MAKE 4 CUT TO FIT
13/16"
5/16"
7/16"
3/4" X 1-1/4" MAHOG.
1-1/4"
3/4"
SLIDE DETAIL CUT LENGTHS TO FIT
6" SINGLE GROOVE FLANGE MOUNTING TYPE SELF ALIGNING BEARING
6" X 2" X 1-1/2" ANGLE
COUNTERSINK BOLTS 1" X 1/4" - 6 REQUIRED
PILLOW BLOCK
7" X 7" X 1-3/4" WOODEN SPACER BLOCK
1" X 1/4" MACHINE BOLT (12 REQ'D)
3/4" SHAFT
3/16" BED PLATE (STEEL)
4-1/2" X 4-1/2" X 1/4" PLATE (STEEL)
13" X 1-1/2" X 1-1/2" ANGLE (2 REQ'D)
CABIN PANELS & SLIDE DETAIL
ENGINE MOUNT
NOTE
TOTAL MAST HEIGHT 27'-6"
TWO HOLE
ONE HOLE
1/8" X 1-1/2" BRONZE STRAP
"A"
FILLER BLOCK
REAR
FRONT
9"
MAIN HALLIARD SHEAVE (2" DIA)
1-3/4"
7/8"
3"
3"
SPREADER
FILLER BLOCK
1-1/2"
MAHOGANY
2-1/2"
6"
TAPER ON BOTTOM & SIDES ONLY
18' TO DECK
1/2" X 1/8" BRONZE STRAP
JUMPER LOCATION
17' TO DECK
3/4" SITKA SPRUCE BOOM
2'-3"
1/2"
5/8" MARCONI TRACK
SPREADER 12' TO DECK
3'-5"
MAST
JUMPER
FILLER BLOCK
10"
2-1/2"
4"
MAST
10"
5/8" MARCONI TRACK
GOOSENECK
2-1/2"
3/4" MARINE PLYWOOD
12"
9'-3"
BEGIN TAPER ABOVE DECK
2-1/2"
"B"
"B"
3/4" SPRUCE
1-3/4"
24"
BIND WITH CORD
3'-7"
CANVAS COLLAR WITH MARINE GLUE
"A" "A" SECTION
FILLER BLOCK
1/2" SPRUCE
DECK
3/8" DRAIN HOLE IN ALL BLOCKS
4"
3/16"
APPROX 30°
NO TAPER
3"
TRACK
"B" "B" SECTION
"C" "C" SECTION
TRACK
"C"
BOOM
6"
2-1/2"
EXTEND FILLER BLOCK 1" TO FIT IN MAST STEP
FRONT VIEW
SHEET 4 OF 5
WAM

to the seams. Stain the deck and apply one coat of varnish right away.

Construction of the cabin has been kept simple. The principal side supports are eight pieces of 1⅛x2¼-in. fir, four to a side. The back ones, at frame No. 4, are carried down to the floor frame and fastened to it with screws. The other uprights do not extend below the deck framing and are screwed to the longitudinals. Bevel the lower ends of these uprights so that they will stand straight, as the longitudinals have an outward slant. The three aft uprights on each side are placed with the greater dimension running lengthwise; the forward ones are set in the opposite direction and notched to receive the roof stringers.

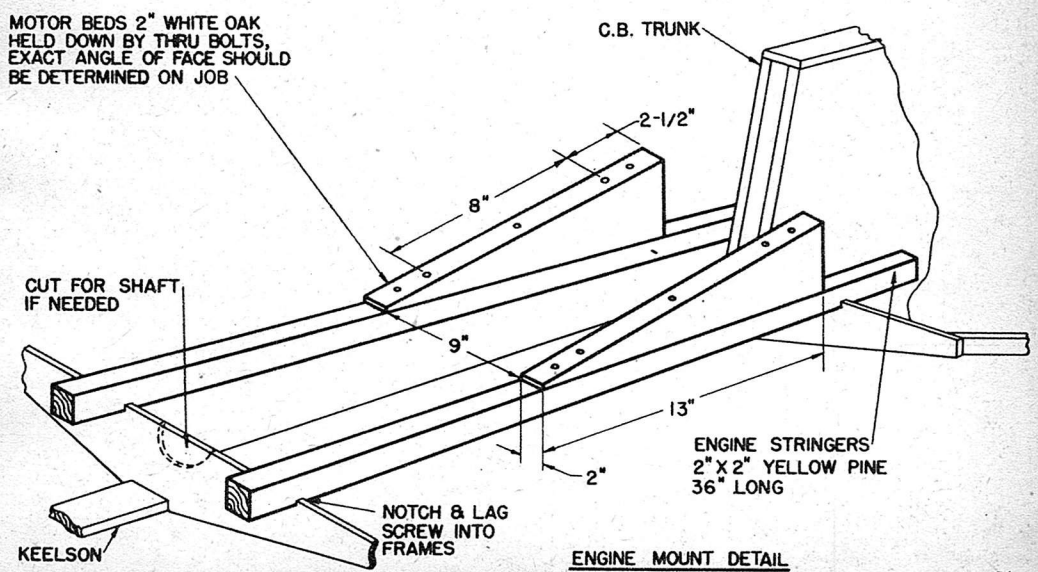
The front panel of the cabin goes on next. Use 1¼-in. No. 8 screws to fasten it to the uprights. Bend in the roof stringers securing them to each upright with two 1¼-in. No. 8 screws. Cut the two back pieces and stand them in place. Make paper patterns of these, taking measurements from the inside of the boat. Notch the chines and sheer strips, and fasten them to the back uprights with 1¼-in. No. 8 screws.

Cut two more pieces of fir for door frames and screw them to the edges of the door opening. Run screws from plywood into fir. It will be found that these uprights, running down behind the slide rails for the removable panels, can be fastened to the floor beam for extra strength. Cut two fir end carlins and screw them to the plywood end pieces, allowing the outside ends to rest on the uprights. The inside ends butt against the door frames. Now saw out the carlin which fits against the front panel and fasten it in place with 1¼-in. No. 8 screws. The two fore and aft roof beams of ⅞x2-in. oak come next and are notched and screwed to the end carlins.

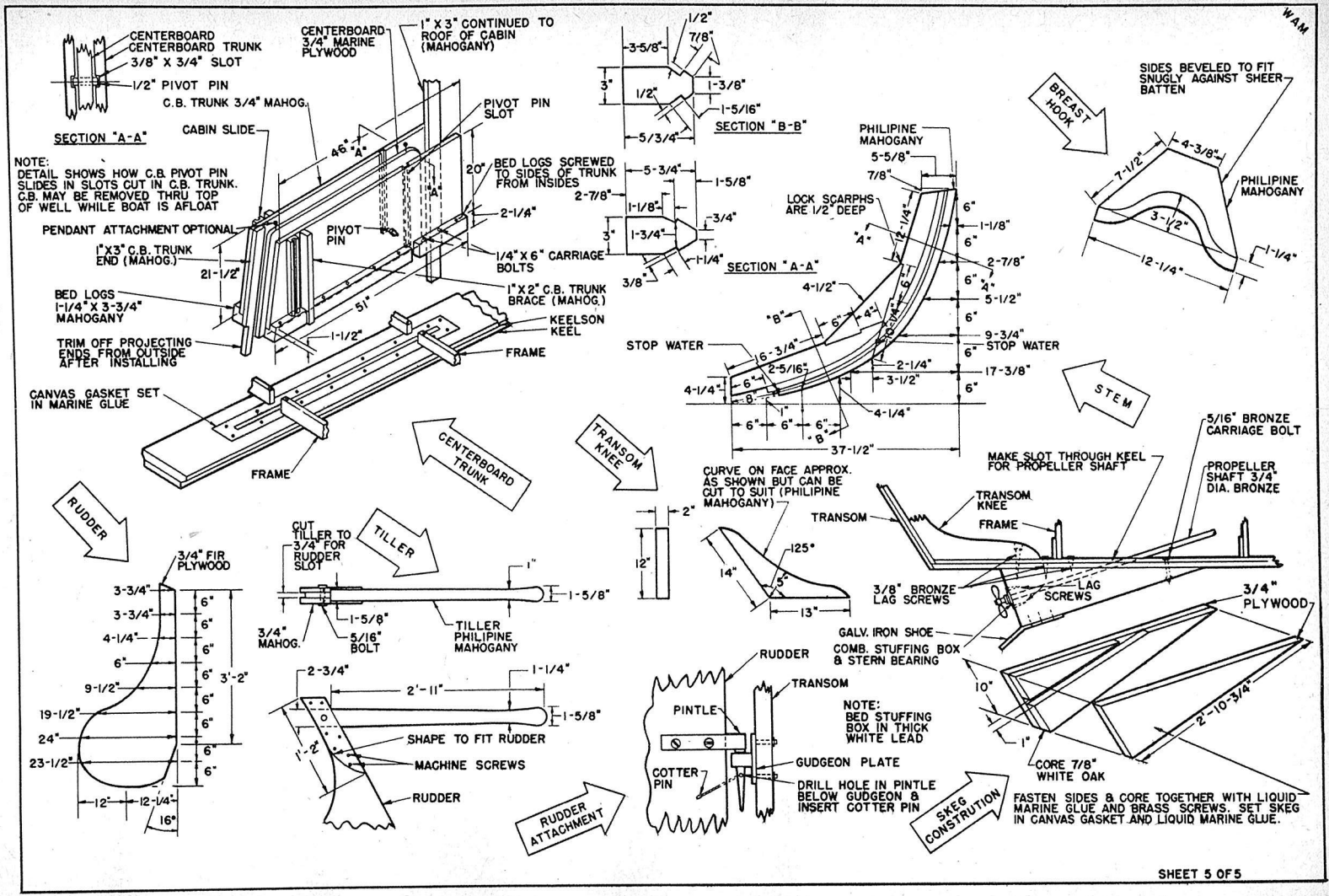
The cabin sides are ⅜-in. plywood and continue aft to a point six inches beyond the cockpit, acting as splashboards. The bottom edges are snug against the deck all along and must be trimmed in a slight upward curve to attain this. Screw the sides to the framework and clamp around the edges of the cockpit temporarily.

The splashboards are lined with ⅜-in. plywood of the same shape but extending down inside the cockpit to cover the deck framing. At the aft end of the cockpit the pieces are notched so the extremities will rest on the afterdeck alongside the splashboard, giving a ¾-in. thickness to the splashboard. Remove the temporary clamps on the splashboard and screw it and the lining to the deck longitudinals. Side ports are cut now or later. The remaining roof carlins are notched into the tops of the fore and aft roof beams and fastened with one screw at each joint. The roof is covered with plywood in three sections, with joints meeting over the roof beams.

The removable panels and slide rails can be fitted below the cabin doors. The top panel is rabbeted as shown to form a stop for the doors. Fasten the hatch slide rails to the cabin roof with 2-in. No. 10 screws, driven from the inside up through the roof



ENGINE MOUNT DETAIL


W.A.M.
CENTERBOARD
CENTERBOARD TRUNK
3/8" X 3/4" SLOT
1/2" PIVOT PIN
C.B. TRUNK 3/4" MAHOG.
SECTION "A-A"
CENTERBOARD 3/4" MARINE PLYWOOD
1" X 3" CONTINUED TO ROOF OF CABIN (MAHOGANY)
PIVOT PIN SLOT
CABIN SLIDE
NOTE: DETAIL SHOWS HOW C.B. PIVOT PIN SLIDES IN SLOTS CUT IN C.B. TRUNK. C.B. MAY BE REMOVED THRU TOP OF WELL WHILE BOAT IS AFLOAT
PENDANT ATTACHMENT OPTIONAL
1"X3" C.B. TRUNK END (MAHOG.)
PIVOT PIN
BED LOGS 1-1/4" X 3-3/4" MAHOGANY
TRIM OFF PROJECTING ENDS FROM OUTSIDE AFTER INSTALLING
CANVAS GASKET SET IN MARINE GLUE
FRAME
KEELSON
KEEL
1" X 2" C.B. TRUNK BRACE (MAHOG.)
1/4" X 6" CARRIAGE BOLTS
BED LOGS SCREWED TO SIDES OF TRUNK FROM INSIDES
SECTION "B-B"
SECTION "A-A"
PHILIPINE MAHOGANY
LOCK SCARPHS ARE 1/2" DEEP
STOP WATER
BREAST HOOK
SIDES BEVELED TO FIT SNUGLY AGAINST SHEER BATTEN
PHILIPINE MAHOGANY
STEM
CENTERBOARD TRUNK
TRANSOM KNEE
CURVE ON FACE APPROX. AS SHOWN BUT CAN BE CUT TO SUIT (PHILIPINE MAHOGANY)
TRANSOM
FRAME
TRANSOM KNEE
5/16" BRONZE CARRIAGE BOLT
MAKE SLOT THROUGH KEEL FOR PROPELLER SHAFT
PROPELLER SHAFT 3/4" DIA. BRONZE
3/8" BRONZE LAG SCREWS
LAG SCREWS
3/4" PLYWOOD
GALV. IRON SHOE
COMB. STUFFING BOX & STERN BEARING
CORE 7/8" WHITE OAK
RUDDER
3/4" FIR PLYWOOD
TILLER
CUT TILLER TO 3/4" FOR RUDDER SLOT
3/4" MAHOG.
5/16" BOLT
TILLER PHILIPINE MAHOGANY
SHAPE TO FIT RUDDER
MACHINE SCREWS
RUDDER
RUDDER ATTACHMENT
PINTLE
COTTER PIN
TRANSOM
NOTE: BED STUFFING BOX IN THICK WHITE LEAD
GUDGEON PLATE
DRILL HOLE IN PINTLE BELOW GUDGEON & INSERT COTTER PIN
SKEG CONSTRUTION
FASTEN SIDES & CORE TOGETHER WITH LIQUID MARINE GLUE AND BRASS SCREWS. SET SKEG IN CANVAS GASKET AND LIQUID MARINE GLUE.

SHEET 5 OF 5

panels. The hatch cover is made as shown.

Construct the forward hatch cover also, following the sketch. Stain and varnish all exposed mahogany surfaces. Paint the outsides of the hull, cabin sides, front and ends with two coats of yacht white, flat. The inside of the boat should be given a priming coat of aluminum paint, followed by a coat of semi-gloss interior paint.

Put on the deck hardware, door hinges, rudder gudgeons, etc. The bow and stern chocks, bow plate, lip leaders and hinges are screw fastened; mooring bitt, gudgeons and cleats are through-bolted.

For auxiliary power the boat has a 2½-hp, air-cooled, 4-cycle, single-cylinder engine. This engine will move the boat along smoothly at about five knots. A 2:1 reduction gear cuts the boat's speed to less than one knot for trolling, yet allows the engine to operate efficiently within the recommended rpm. The reduction gear is fabricated from stock bearings and pulleys and mounted on a non-corrosive frame with the engine. A simple, two-position clutch connects the engine to the shaft. Incidentally, the 9x6-in. propeller, bronze shaft and stuffing box were bought in a surplus marine center for less than $10.

Construction of the engine mount is detailed in two drawings. The engine stringers are notched into the floor beams and frames and leveled off. As the bottom slopes upward toward the stern, the notches at frame No. 5 will have to be somewhat deeper than those at No. 4. When it is done, the stringers are lag-screwed to the frames. The exact angle of the triangular pieces on which the engine rests must be determined on the job. Temporarily bolt the pieces in place on the stringers and place the engine upon them.

Determine the spot where the shaft will go through the bottom of the boat and cut a 1-in. wide slot through the keel and keelson at this point. Make the skeg as shown, assemble with screws and marine glue and shape the top to fit flush against the keel. Be sure the slot in the skeg is roomy so that the shaft will not bind.

Place the skeg up against the keel and wedge it in place with a stick between it and the floor. Then get down on hands and knees and peep through the shaft hole to see if it lines up with the engine coupling. If the shaft opening is in correct alignment, the coupling will appear as a perfect circle in the exact center with none of its inside walls visible. When you think you have it, run the shaft itself into the opening and push it into the coupling. It should go in quite easily if the lineup is correct. Check that it revolves freely without binding and, when satisfied, bore holes through the keel from the inside for the lags and bolt that will hold the skeg. Remove the skeg and cut a canvas gasket to fit between it and the keel, allowing a hole for the shaft. Soak the gasket in marine glue, put it in place and fasten the skeg. Replace the shaft and secure the engine permanently.

The rudder is cut from ¾-inch fir plywood to the shape and dimensions given in the drawing. The tiller may be either mahogany or oak. It is held to the rudder by side pieces of oak. A carriage bolt pivots the tiller assembly on the rudder.

The inside of the cabin and cockpit will not be described in detail, as each builder will have his own ideas about how he wants them arranged. However, a few general suggestions may be of help. You will probably want two bunks. Let them run from the aft cabin walls forward and diagonally in toward the center of the boat until they almost meet in front of the mast step which should be put in before the bunks and fastened to the keel with two carriage bolts inserted from the outside.

It is suggested that two seats be installed lengthwise on either side of the cockpit, at a convenient height. Plywood, ½ or ¾ in. thick, is ideal for flooring, both in cabin and cockpit. Cabin floors are supported by the floor beams. In the cockpit it will be necessary to screw extra supports to the beams and cut the floor boards to fit around the motor. Incidentally, if you decide to pipe the exhaust out through the transom, a hole should be cut in one of the floor boards to allow the pipe clearance.

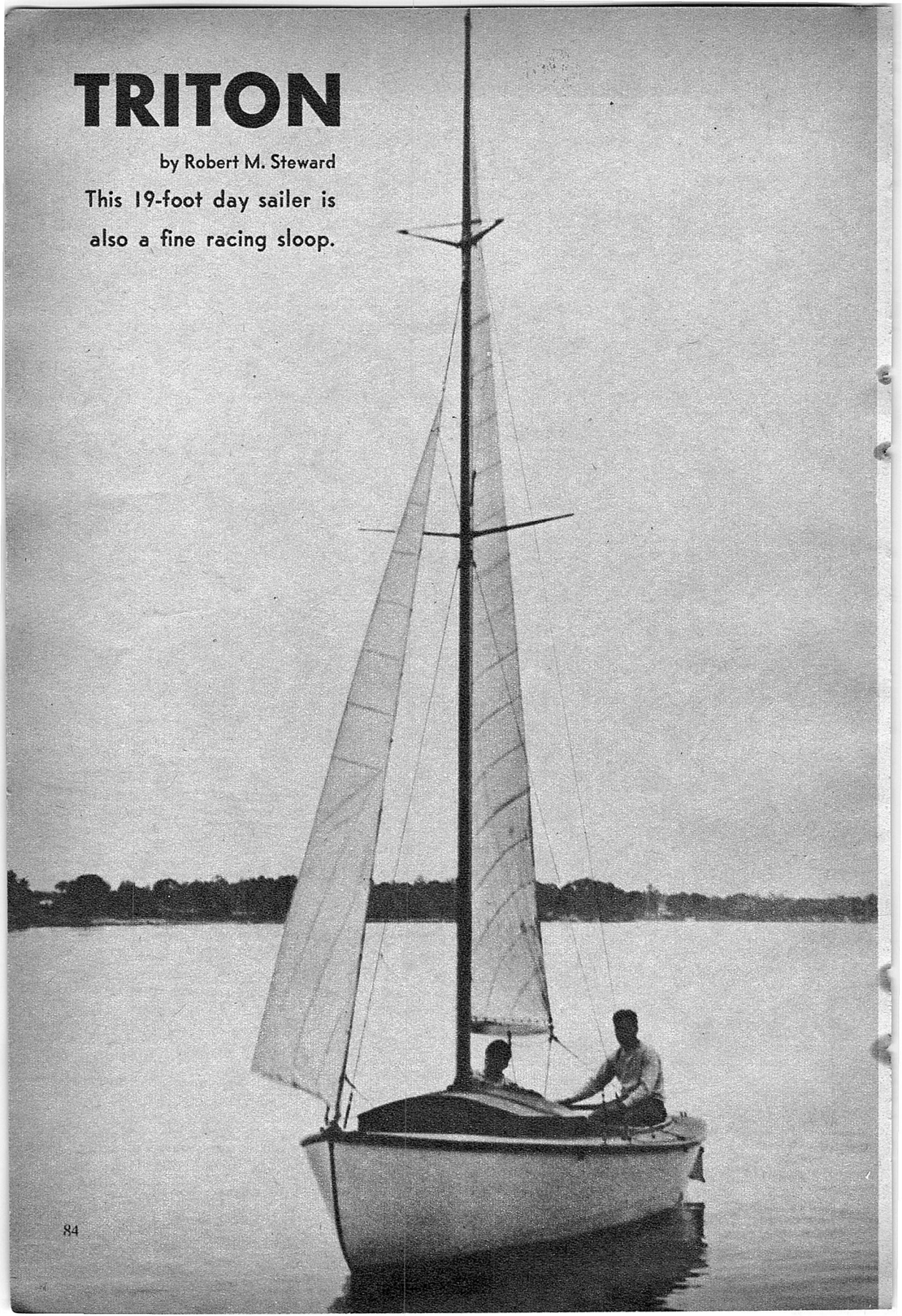
Use 1-inch quarter-round moldings along the deck cabin seam, and 1-inch half-round along the deck-topsides seam and cabin roof seam. Set all molding in Kuhls bedding compound and fasten with countersunk, plugged screws.

Spar construction is detailed in the drawings. Note the use of filler blocks in the hollow mast wherever hardware is used. Mast and boom are finished with four coats of top-grade spar varnish, sanding lightly between coats. A paint job completes the boat. •

TRITON

by Robert M. Steward

This 19-foot day sailer is also a fine racing sloop.



"THERE are darn few popular small boats," said Editor Leonardi, "with enough room to take Aunt Agatha out sailing." And so we have Triton, designed as a safe wholesome day sailer with a moderate sail plan, suitable either for family use or as a one-design racing class. It is inevitable, of course, that hardy youth will cruise overnight in a boat 19 feet 6 inches long, and for this reason a cuddy has been incorporated in the design for protection from the weather.

Beam and freeboard have been made generous for stability and dryness and her arc bottom will not be hard to drive under sail, although Triton has not been designed as a lightweight racing machine. The hull, properly built, will stand much abuse and the choice of materials is wide, permitting the boat to be built anywhere.

Because of the simple hull form, Triton is one of the easiest to lay down. Inasmuch as the bottom frames between keel and chine are an arc of a circle, the bottom of the transom is not a true arch because of the rake of the transom, but is actually so close to an arch that the scale development on the drawing board using four bottom buttocks resulted in a series of points through which an arc could be passed without trouble. Accordingly, the dimensions for the bottom of the transom shown on the plans may not be exactly correct and should be used with caution. To be sure of bottom, develop it with buttocks drawn from the full size after sections, including station A.

One of the principal objects of full-sized lines, besides obtaining the shape and bevels of stem, stem rabbet, etc., is to have a drawing of the sections from which to make the frames located on the numbered stations. Deduct the thickness of the planking from the sections before making the frames. The hull is best built upside down, and when setting up be sure to consult the construction plan to see whether a frame is set to the forward or after side of its station. When correctly located there will be ample material on the frame edges to bevel off for the planking.

Carefully set up and brace the frames, then add the stem, transom and knee, keel, chines and clamps. Deck beams the full width of the boat may be attached to the frames at the time they are made or left out until the hull is turned over. The intermediate frames, which stiffen the planking and eliminate prefabricating a greater number of frames, may be either installed after the planking is on or added to the primary frame with temporary fastenings, and held in place by planking fastenings alone. No connections are necessary between intermediate frames and the chines.

The materials shown on the plans are but a guide, and local boat building materials of equal value may be substituted. Frames and chines may be of white oak or mahogany, or spruce may be used where minimum hull weight is desired. Keel, stem and centerboard beds are best of material not lighter than mahogany and may be of white oak. Deck beams may be spruce, fir, Oregon pine, Port Orford cedar or similar wood, while half-inch white pine or cedar may be substituted for plywood decking and would be best if strip built with edge fastenings between the beams, and canvas covered.

White cedar, Port Orford cedar or mahogany are all satisfactory woods for planking. In some parts of the country cypress planking is favored, but it will soak up a large quantity of water that will be carried around as unnecessary weight.

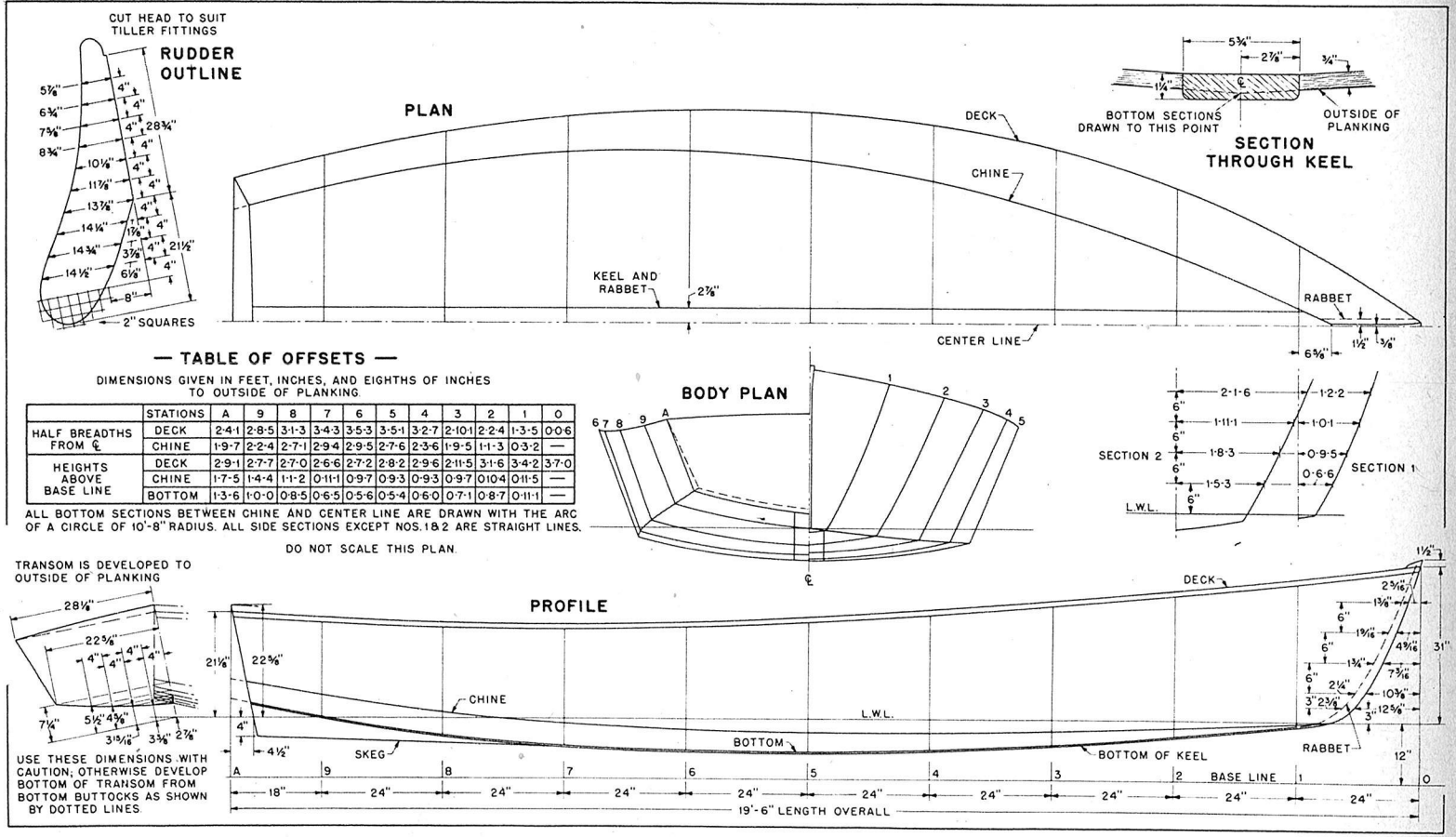
If the plank edges are tightly fitted the seams may be caulked with cotton wicking rolled in with a caulking wheel. Otherwise caulk in the conventional manner. The edges may also be shiplapped, with the laps fastened together with screws from the inside. Or the planking may be double, if you want a really fancy job; an inner skin of quarter-inch white cedar is suggested.

Fastenings are an important part of any boat regardless of size, and are best of bronze throughout. Most parts of Triton will be screw fastened except where bolts are a must, such as in joining parts of the stem to each other, stem to keel, etc. At other places it would seem that there is a choice of fastening, such as in joining a side frame to a bottom frame and fastening the floors to the keel, but bolts are preferable where through fastenings in main structural members are possible.

The sloop rig in Triton is simple, yet modern enough that tuning-up lessons will prove of value when the skipper graduates to a larger boat. Make the spars of clear Sitka spruce if possible, or clear Douglas fir as a second choice. Rigging tangs may be purchased from hardware manufacturers or made from the detail plans. They are not complicated, being almost 100 per cent of one width and thickness strip bronze. Making the tangs consists mostly of drilling holes in the right places, a little sawing, bending and filing.

The standing rigging should be either stainless steel or marine galvanized improved plow steel. •

James Parrish of Baltimore relaxes aboard Triton. You, too, can build this boatload of pleasure.



— TABLE OF OFFSETS —

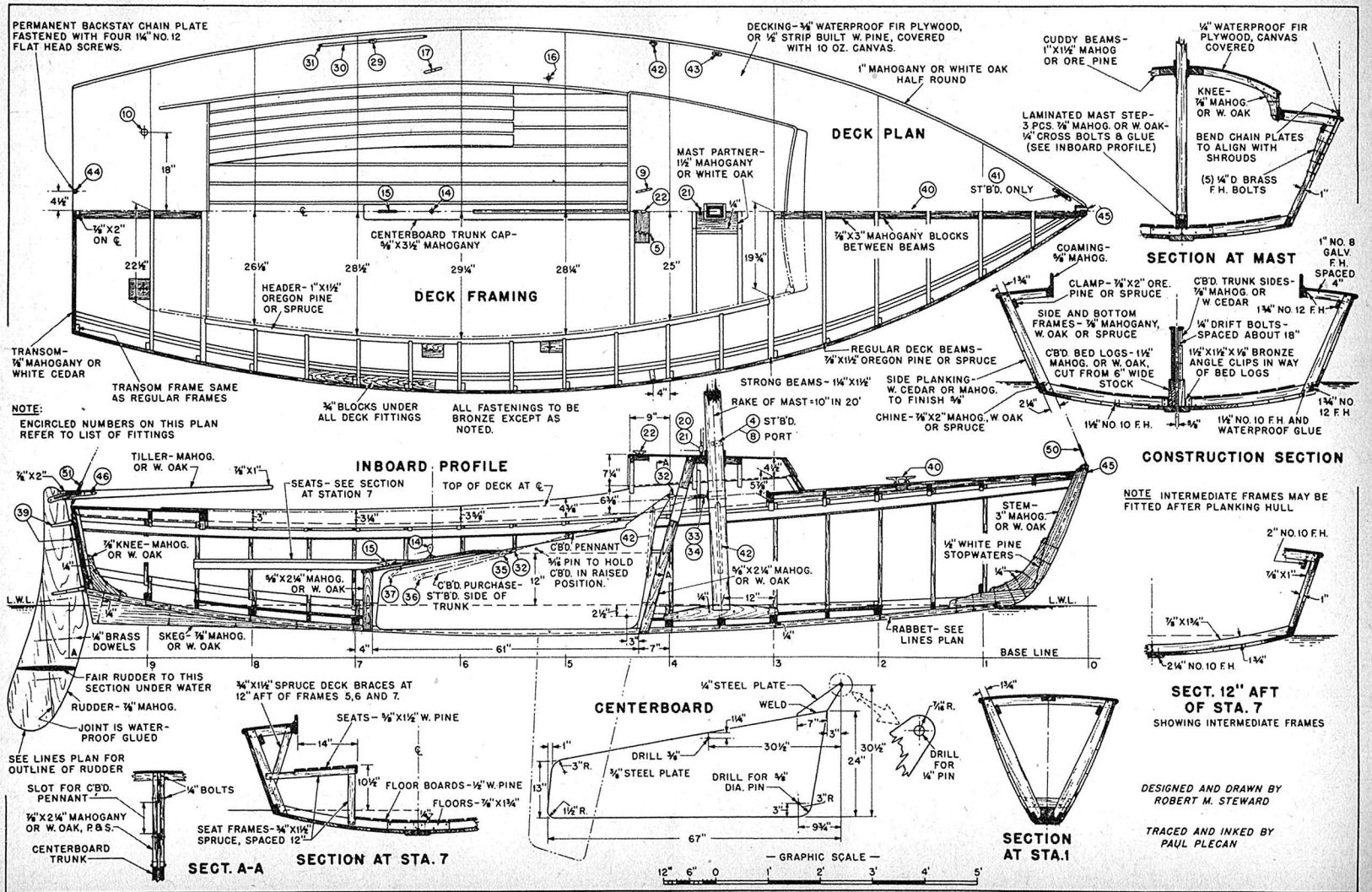
DIMENSIONS GIVEN IN FEET, INCHES, AND EIGHTHS OF INCHES TO OUTSIDE OF PLANKING.

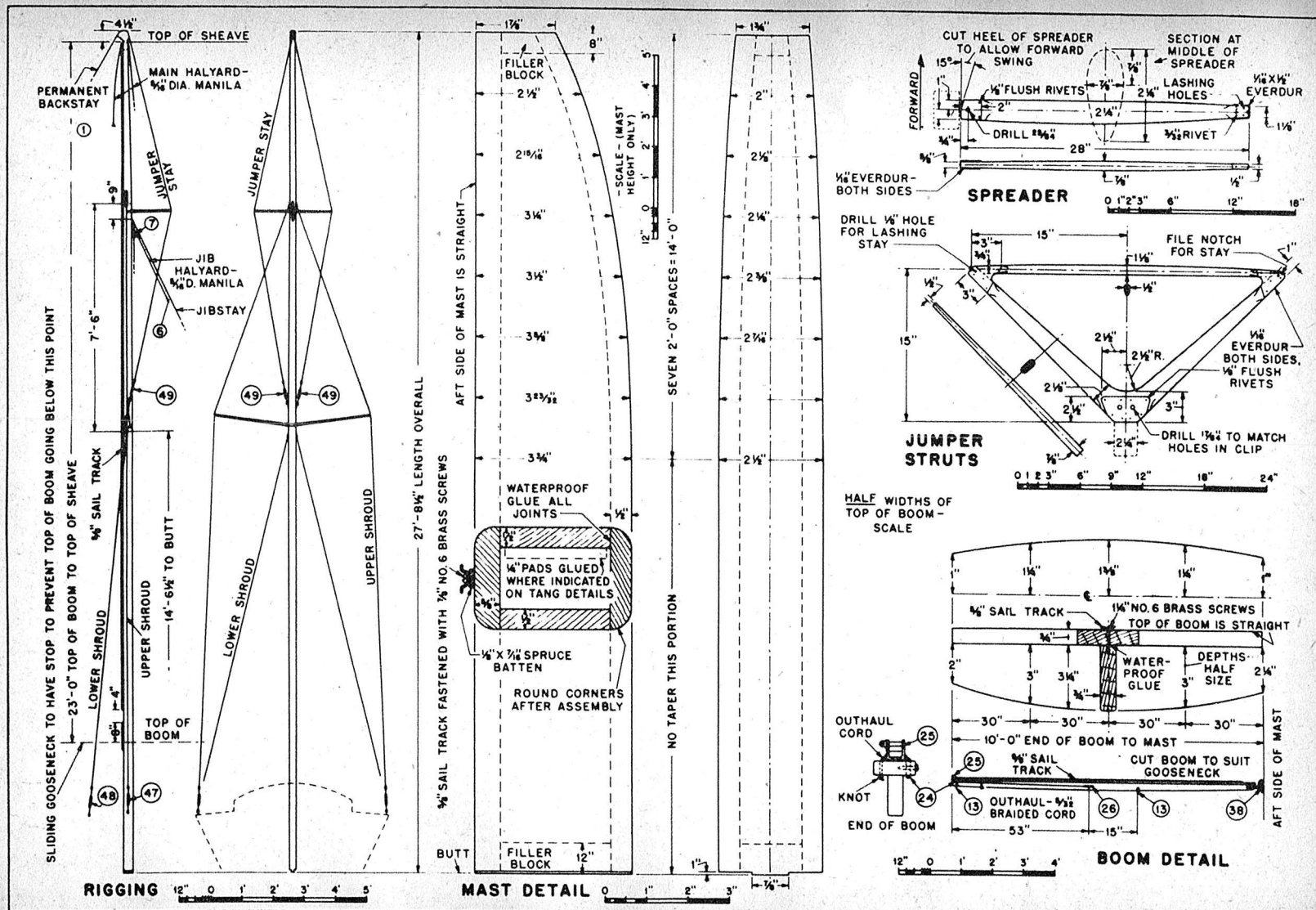
	STATIONS	A	9	8	7	6	5	4	3	2	1	0
HALF BREADTHS FROM ℄	DECK	2-4-1	2-8-5	3-1-3	3-4-3	3-5-3	3-5-1	3-2-7	2-10-1	2-2-4	1-3-5	0-0-6
	CHINE	1-9-7	2-2-4	2-7-1	2-9-4	2-9-5	2-7-6	2-3-6	1-9-5	1-1-3	0-3-2	—
HEIGHTS ABOVE BASE LINE	DECK	2-9-1	2-7-7	2-7-0	2-6-6	2-7-2	2-8-2	2-9-6	2-11-5	3-1-6	3-4-2	3-7-0
	CHINE	1-7-5	1-4-4	1-1-2	0-11-1	0-9-7	0-9-3	0-9-3	0-9-7	0-10-4	0-11-5	—
	BOTTOM	1-3-6	1-0-0	0-8-5	0-6-5	0-5-6	0-5-4	0-6-0	0-7-1	0-8-7	0-11-1	—

ALL BOTTOM SECTIONS BETWEEN CHINE AND CENTER LINE ARE DRAWN WITH THE ARC OF A CIRCLE OF 10'-8" RADIUS. ALL SIDE SECTIONS EXCEPT NOS. 1 & 2 ARE STRAIGHT LINES.

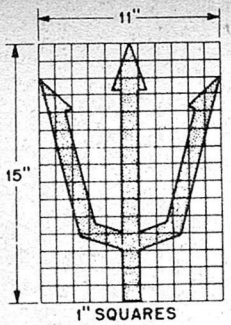
DO NOT SCALE THIS PLAN.

USE THESE DIMENSIONS WITH CAUTION; OTHERWISE DEVELOP BOTTOM OF TRANSOM FROM BOTTOM BUTTOCKS AS SHOWN BY DOTTED LINES.


PERMANENT BACKSTAY CHAIN PLATE FASTENED WITH FOUR 1¼" NO. 12 FLAT HEAD SCREWS.
DECKING – ⅜" WATERPROOF FIR PLYWOOD, OR ½" STRIP BUILT W. PINE, COVERED WITH 10 OZ. CANVAS.
1" MAHOGANY OR WHITE OAK HALF ROUND
DECK PLAN
MAST PARTNER – 1½" MAHOGANY OR WHITE OAK
ST'B'D. ONLY
⅞"X2" ON ℄
CENTERBOARD TRUNK CAP – ⅜"X3½" MAHOGANY
⅞"X3" MAHOGANY BLOCKS BETWEEN BEAMS
HEADER – 1"X1½" OREGON PINE OR SPRUCE
DECK FRAMING
TRANSOM – ⅞" MAHOGANY OR WHITE CEDAR
TRANSOM FRAME SAME AS REGULAR FRAMES
¾" BLOCKS UNDER ALL DECK FITTINGS
ALL FASTENINGS TO BE BRONZE EXCEPT AS NOTED.
NOTE:
ENCIRCLED NUMBERS ON THIS PLAN REFER TO LIST OF FITTINGS
REGULAR DECK BEAMS – ⅞"X1½" OREGON PINE OR SPRUCE
STRONG BEAMS – 1¼"X1½"
RAKE OF MAST = 10" IN 20'
4 ST'B'D.
8 PORT
SIDE PLANKING – W. CEDAR OR MAHOG. TO FINISH ⅝"
CHINE – ⅞"X2" MAHOG., W. OAK OR SPRUCE
INBOARD PROFILE
TILLER – MAHOG. OR W. OAK
SEATS – SEE SECTION AT STATION 7
TOP OF DECK AT ℄
⅞"KNEE – MAHOG. OR W. OAK
⅝"X2¼" MAHOG. OR W. OAK
C'B'D. PENNANT
⅜" PIN TO HOLD C'B'D. IN RAISED POSITION.
C'B'D. PURCHASE – ST'B'D. SIDE OF TRUNK
⅝"X2¼" MAHOG. OR W. OAK
STEM – 3" MAHOG. OR W. OAK
½" WHITE PINE STOPWATERS
RABBET – SEE LINES PLAN
L.W.L.
BASE LINE
¼" BRASS DOWELS
SKEG – ⅞" MAHOG. OR W. OAK
FAIR RUDDER TO THIS SECTION UNDER WATER
RUDDER – ⅞" MAHOG.
JOINT IS WATER-PROOF GLUED
SEE LINES PLAN FOR OUTLINE OF RUDDER
¾"X1½" SPRUCE DECK BRACES AT 12" AFT OF FRAMES 5,6 AND 7.
SEATS – ⅝"X1½" W. PINE
FLOOR BOARDS – ½" W. PINE
FLOORS – ⅞"X1¾"
SEAT FRAMES – ¾"X1½" SPRUCE, SPACED 12"
SLOT FOR C'B'D. PENNANT
¼" BOLTS
⅜"X2¼" MAHOGANY OR W. OAK, P & S.
CENTERBOARD TRUNK
SECT. A-A
SECTION AT STA. 7
CENTERBOARD
¼" STEEL PLATE
WELD
DRILL ⅜"
⅜" STEEL PLATE
DRILL FOR ⅜" DIA. PIN
DRILL FOR ¼" PIN
GRAPHIC SCALE
SECTION AT STA. 1
CUDDY BEAMS – 1"X1½" MAHOG OR ORE. PINE
¼" WATERPROOF FIR PLYWOOD, CANVAS COVERED
KNEE – ⅞" MAHOG. OR W. OAK
LAMINATED MAST STEP – 3 PCS. ⅞" MAHOG. OR W. OAK – ¼" CROSS BOLTS & GLUE (SEE INBOARD PROFILE)
BEND CHAIN PLATES TO ALIGN WITH SHROUDS
(5) ¼" D BRASS F.H. BOLTS
SECTION AT MAST
COAMING – ⅝" MAHOG.
CLAMP – ⅞"X2" ORE. PINE OR SPRUCE
SIDE AND BOTTOM FRAMES – ⅞" MAHOGANY, W. OAK OR SPRUCE
C'B'D. BED LOGS – 1½" MAHOG. OR W. OAK, CUT FROM 6" WIDE STOCK
C'B'D. TRUNK SIDES – ⅞" MAHOG. OR W. CEDAR
¼" DRIFT BOLTS – SPACED ABOUT 18"
1½"X1½"X⅛" BRONZE ANGLE CLIPS IN WAY OF BED LOGS
1" NO. 8 GALV. F.H. SPACED 4"
1¾" NO. 12 F.H.
1¼" NO. 10 F.H.
1½" NO. 10 F.H. AND WATERPROOF GLUE
CONSTRUCTION SECTION
NOTE INTERMEDIATE FRAMES MAY BE FITTED AFTER PLANKING HULL
2" NO. 10 F.H.
⅞"X1½"
⅞"X1¾"
2¼" NO. 10 F.H.
SECT. 12" AFT OF STA. 7
SHOWING INTERMEDIATE FRAMES
DESIGNED AND DRAWN BY ROBERT M. STEWARD
TRACED AND INKED BY PAUL PLECAN


TOP OF SHEAVE
PERMANENT BACKSTAY
MAIN HALYARD- 5/16" DIA. MANILA
JUMPER STAY
JIB HALYARD- 5/16" D. MANILA
JIBSTAY
SLIDING GOOSENECK TO HAVE STOP TO PREVENT TOP OF BOOM GOING BELOW THIS POINT
23'-0" TOP OF BOOM TO TOP OF SHEAVE
7'-6"
9"
3/8" SAIL TRACK
UPPER SHROUD
14'-6 1/2" TO BUTT
LOWER SHROUD
4"
6"
TOP OF BOOM
LOWER SHROUD
UPPER SHROUD
27'-8 1/2" LENGTH OVERALL
RIGGING
FILLER BLOCK
AFT SIDE OF MAST IS STRAIGHT
3/8" SAIL TRACK FASTENED WITH 7/8" NO. 6 BRASS SCREWS
WATERPROOF GLUE ALL JOINTS
1/4" PADS GLUED WHERE INDICATED ON TANG DETAILS
1/8" X 7/16" SPRUCE BATTEN
ROUND CORNERS AFTER ASSEMBLY
BUTT
FILLER BLOCK
SCALE - (MAST HEIGHT ONLY)
SEVEN 2'-0" SPACES = 14'-0"
NO TAPER THIS PORTION
MAST DETAIL
CUT HEEL OF SPREADER TO ALLOW FORWARD SWING
SECTION AT MIDDLE OF SPREADER
FORWARD
1/8" FLUSH RIVETS
LASHING HOLES
1/16" X 1 1/2" EVERDUR
DRILL 29/64"
3/32" RIVET
28"
1/16" EVERDUR - BOTH SIDES
SPREADER
DRILL 1/8" HOLE FOR LASHING STAY
FILE NOTCH FOR STAY
15"
1/16" EVERDUR BOTH SIDES, 1/8" FLUSH RIVETS
2 1/2" R.
DRILL 17/64" TO MATCH HOLES IN CLIP
JUMPER STRUTS
HALF WIDTHS OF TOP OF BOOM - SCALE
3/8" SAIL TRACK
1/4" NO. 6 BRASS SCREWS
TOP OF BOOM IS STRAIGHT
WATER-PROOF GLUE
DEPTHS - HALF SIZE
30" 30" 30" 30"
10'-0" END OF BOOM TO MAST
OUTHAUL CORD
KNOT
END OF BOOM
3/8" SAIL TRACK
CUT BOOM TO SUIT GOOSENECK
OUTHAUL - 3/32" BRAIDED CORD
53"
15"
AFT SIDE OF MAST
BOOM DETAIL

SAIL PLAN



RACING NUMBERS 12" HIGH

LARGE SCALE BLUEPRINTS will simplify construction. Send $10.00 to Twenty Boats Plans Dept., The Rudder Pub. Co., 9 Murray St., New York 7, N. Y. Specify Plan FB-362 Triton.

KING KAT

by Keith Vining

Slung from a bipod mast, the lateen rig of this cat gives maximum performance on either tack or reach.

KING KAT is a classy little catamaran that's easy to build and easy on the pocketbook. What's more, it sports a rig which makes it perform like a dream.

The triangular sail, stretched between a sloping yard and a boom, has been slung from a short mast for almost as long as men have sailed. Apart from being beautiful in silhouette, it's an efficient airfoil. A disadvantage has been that conventional (if stubby) mast. Of necessity, the yard and boom are slung to one side. This is fine when we're racing along with the sail on the lee side of the mast, but what happens when we want to come about? Then the otherwise perfect sail wraps itself around the mast like a wind-swept skirt on a damsel's leg — only the result isn't so satisfying. Gone is the advantage, and unless we can find some way to hustle that sail around to the other side of the mast, what's gained on the starboard tack is lost on the port, or vice versa.

What's needed is a sky hook to hold that yard up — and what we have in King Kat is practically that. But we have a pair of sturdy plywood legs holding that "hook" up and a stub mast to tie down the boom. Practical? Yes indeed, for on a catamaran we have a base broad enough to spread that bipod far enough to leave the sail clear at all times. Better yet, there are no stays to worry about. The top of the mast can be parted by loosening one nut, the bottom unhooked by tipping the legs outboard, the boom released by removing a pin and the

whole wrapped up under the arm. The sailing cat can then be used as an outboard.

Want to build it? Here's how: Begin construction with the hulls. Do not let the fact that there are two of these frighten you. Thanks to the fact that these hulls are identical, and that the lines are laid down so that every frame has the identical bevel from the vertical, we can set up a production line and build both hulls faster than we could a simple V-bottom hull of equivalent displacement.

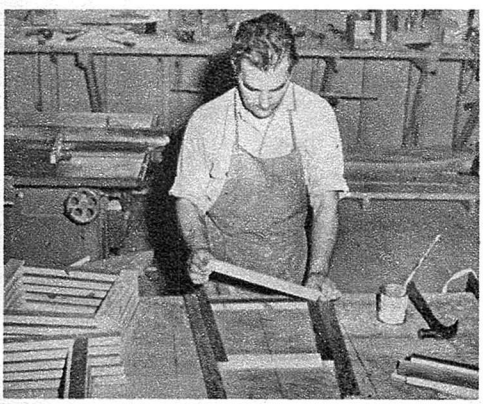
Cut the side, bottom and deck strips of all frames to length, using only one setting of the miter gauge on your saw. Take note that the sides are extended beyond what will be the deck line. This is to permit assembly on the building frame. Excess will be cut off later. Begin assembly of frames by building a simple jig as in the first captioned photograph. Two boards are nailed to the bench at the proper angle to take both sets of frames numbered 2 through 6. A strip of plywood is glued and nailed across the top and bottom of each frame. One of these strips is shown being added in the photo. The nails are that new boon to plywood boat builders, Johns-Manville Asbestos Siding Nails, made of brass, cadmium plated, thin headed and coming in sizes from 1 inch up. Plywood may be shop scrap, so long as it is waterproof. In building frames 1 and 7 for both hulls, simply move one side of the jig in to get the narrower width. Frames are notched for sheer and chine clamps with a dado head and set aside.

The stem and stern liner rabbeted stock are identical as to cross section and may be cut from one timber. As with the frames, this stock must be cut longer than final size to permit it to extend to the building frame.

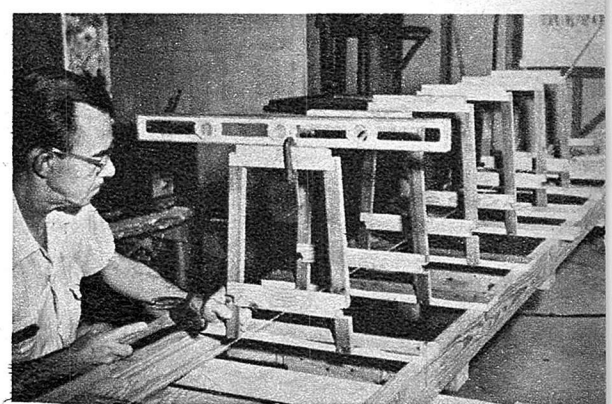
The building frame consists of two 2x4s, spread to 18 inches with heavy stock at ends, and diagonally braced with scrap plywood or lumber. A 1x4 is nailed across this frame at right angles at all stations taking a boat frame. Be sure and check for square.

The hull frame is aligned to a stretched chalk line at the required height above building frame. This line is to be plumb, regardless of shop floor. A simple method

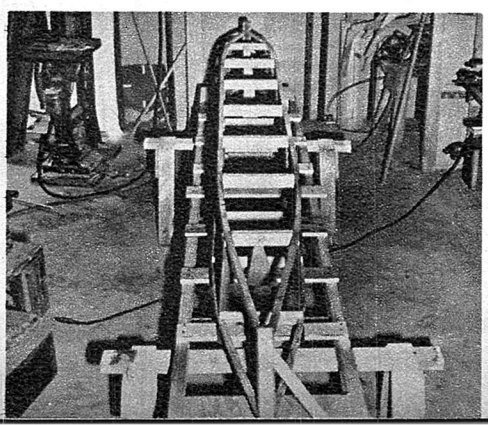
Frames 2 and 6 are alike in both hulls. Jigs (two boards nailed to bench, right) speed work.



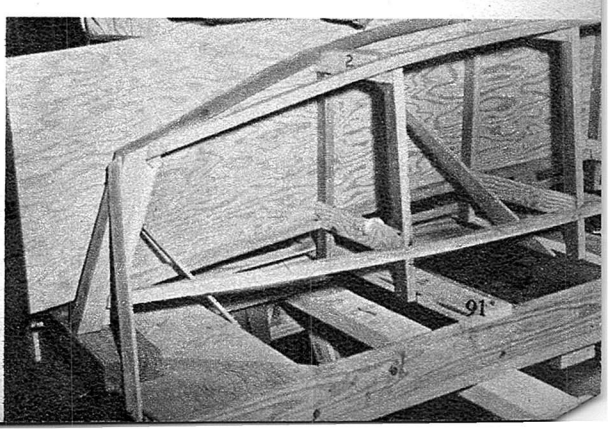
Level and a taut line—vital to good work—are used for aligning frames on the building frame.

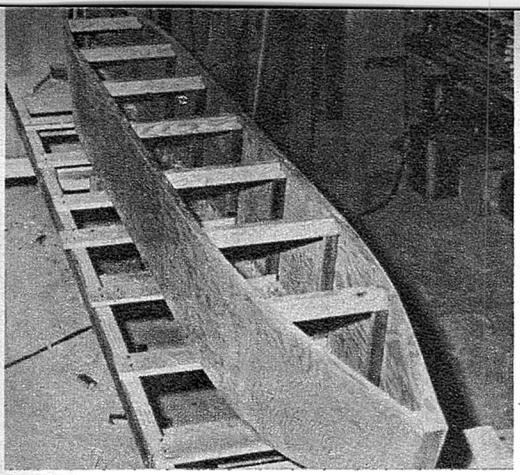


Completed hull frame. Use a hard wood for chine and sheer clamps; simplify bending by soaking.

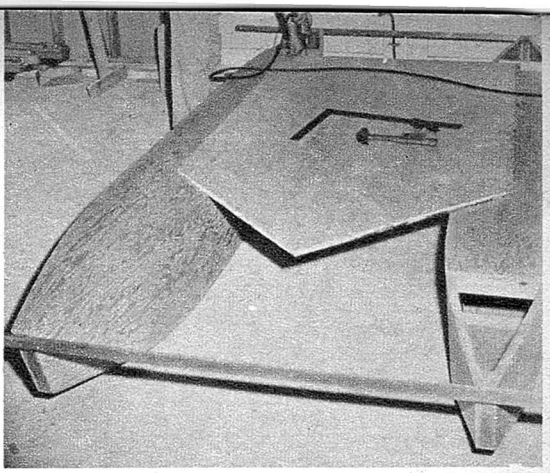


Strip of ¼-in. plywood (15½ in. wide) is clamped to side, scribed, then cut with hand-power saw.

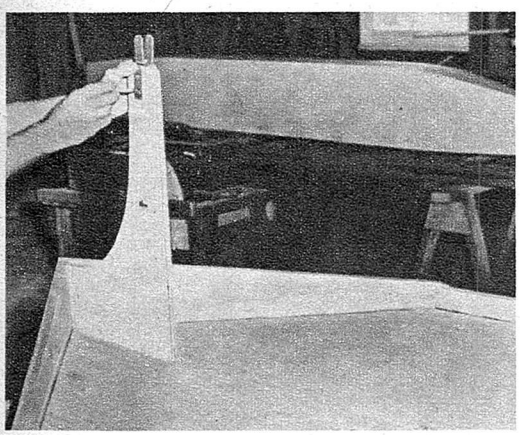




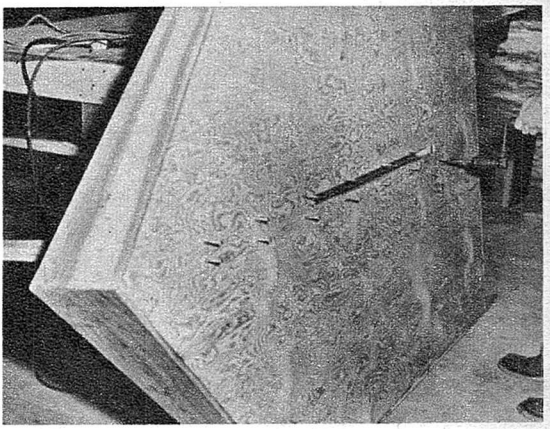
Hull is ready for deck. Deck may be pieced from short lengths if joints are centered on frames.



Align hulls, brace at 4' ¾" o.c. and set the cockpit deck in place for the drilling of holes.



Stagger the holes on the swivel fitting of the stub mast so that screws won't meet in the wood.

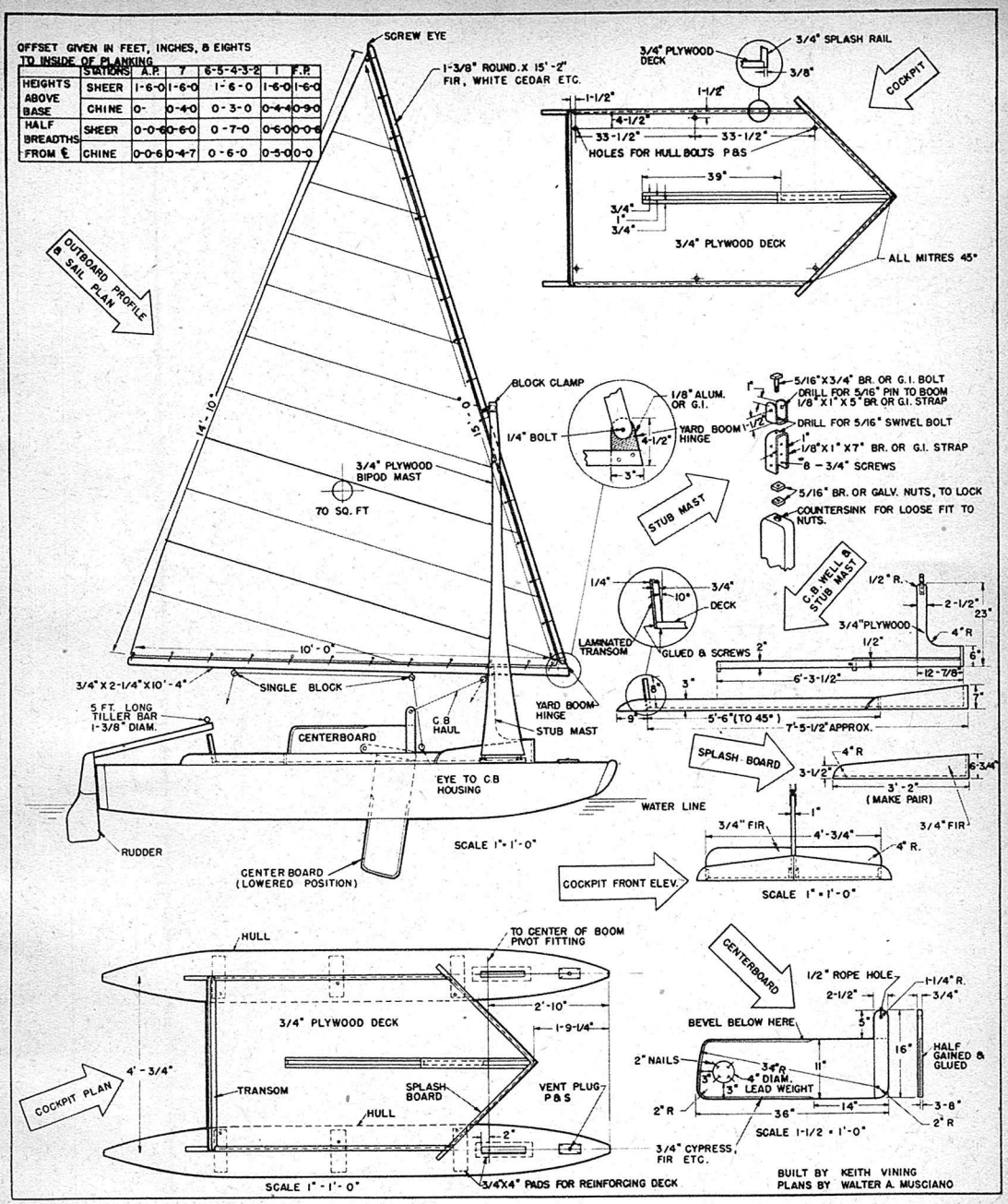


The stub mast and centerboard well assembly are fastened from beneath and at bow of splashboard.

of single-handed leveling of frames to centers is illustrated. Note the level, clamped to frame, and the centerline heavily scribed on each frame. Frames are squared off and braced with scrap plywood or lumber. Blocks holding the taut string will come out to make way for the stem and stern liners, which are cut to the proper bevel, toenailed to the building frame and cross-braced with scrap.

The ¾x⅞-in. chine and sheer clamps are now installed. Except you're using real hard wood, the hardest bend (the chine at the bow end) may be accomplished by soaking overnight. Very hard woods such as oak might need some steaming. These members are fitted to the frames with only some additional beveling required in notches at numbers 1 and 7. This may be done with a wood rasp. Slight beveling required on the side rails of the above frames is done with a small plane after installing the clamps. Clamps are fastened at all joints with Weldwood Glue and 1½-in. brass siding nails. A C-clamp may be needed as additional bracing at the joint of chine and stem liner until the glue sets.

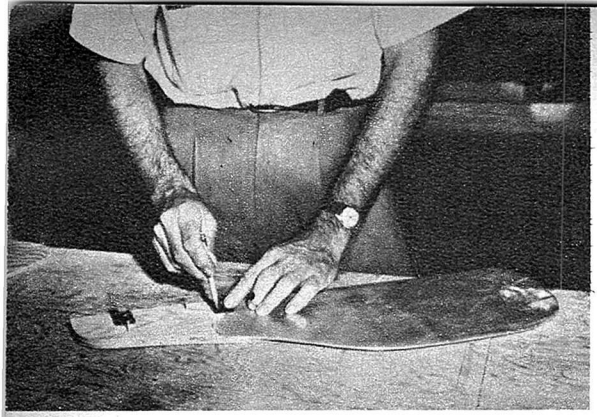
The best way to fit side planking is shown in one of the illustrations. Here a strip 15½ in. wide has been ripped from a 12-ft. panel of the ¼-in. plywood. This strip is tacked or C-clamped about the midsection so that you can push the bow and stern around flat as you trace along chine, sheer and each end. A hand power saw is then used to cut both sides of the hull. Best stay a fraction outside the line when using this method of cutting the moderate curve. And if you use A-C grade plywood (only one good face) make sure that you match sides before cutting so that the best face will be on the outside. A-C grade, incidentally, is perfectly satis-



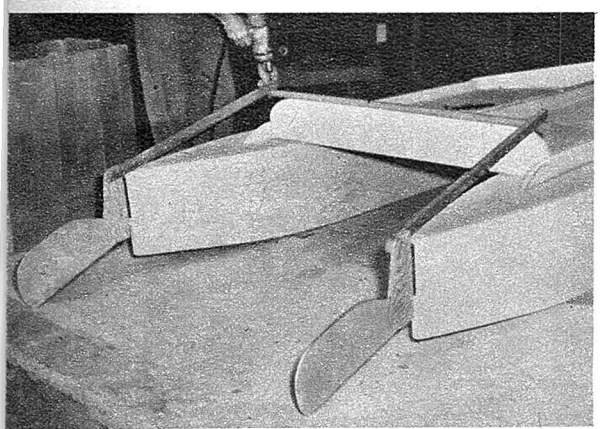
factory for building these sealed hulls.

After sides are secured with glue and 1-in. brass nails spaced at about 3-in. intervals along each clamp and frame, dress both the bottom edges of the side panels and chine clamps with a long plane. Frequently check with a straightedge or level to make sure edges are flat and even. Hull bottoms are scribed, cut and fastened the same way as the sides. A short plane is best to trim the edges of the bottoms flush.

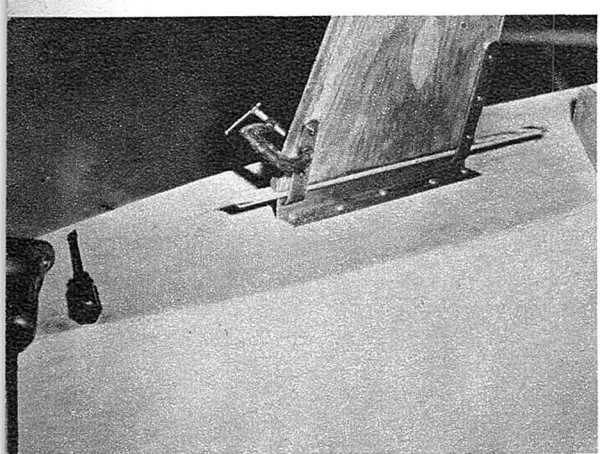
Drive all nails flush with the plywood, using a blunt punch where necessary. Then remove the hull from the building frame. A belt sander, or even a disk sander, may be used with fine paper to complete finish.



Locate and drill the holes for the metal eyes and for the pivot point of the rudder blade.



Place and hold tiller bar under tillers to locate and drill bolt holes. Then bolt it across the top.



Align mast by installing hooks at base of legs as explained in text. Note spacer beneath leg.

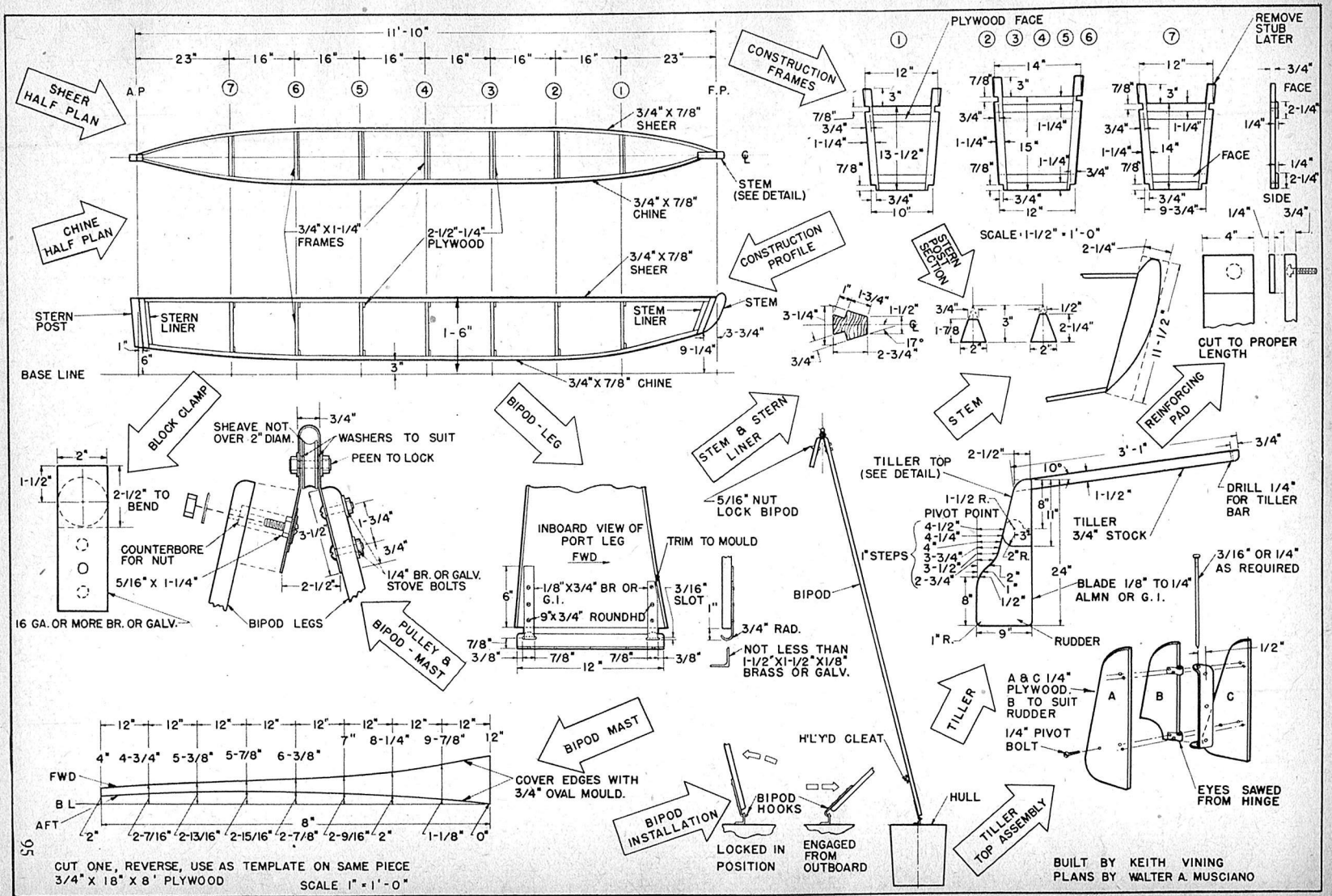
The brass nails will sand right down with the plywood to become invisible after painting. Topside, the extended lumber used to fasten the hull to the building is cut off and the edges are dressed to take the deck.

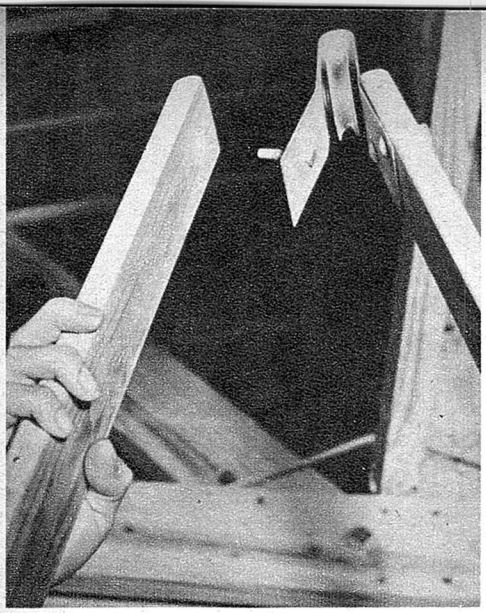
Decks may be covered with shorter lengths of plywood if they are available, so long as joints come over frames, or reinforcement pads, which we take up now. The reinforcement pads go beneath the decks, so the decks are not fastened until the pads are located and installed. First, fit the decks and mark each part plainly before laying it aside. Then cut the pads and temporarily tack them in the proper location on the underside of each deck. Next, temporarily tack the decks in place.

Align hulls on a level floor and brace at the proper distance apart (4¾-in. o.c.). The cockpit deck is now cut to size and set on the hulls where indicated. The temporary brace, across the stem liners, may be used to measure the distance back to the point of this deck (1 ft. 9¼ in.). Locate the bolt holes in the cockpit and drill for ⅜-in. bolts right down through the cockpit deck, hull decks and reinforcement pads. You have used one of the oldest and best of the pattern-maker's tricks to insure alignment at all times in the future.

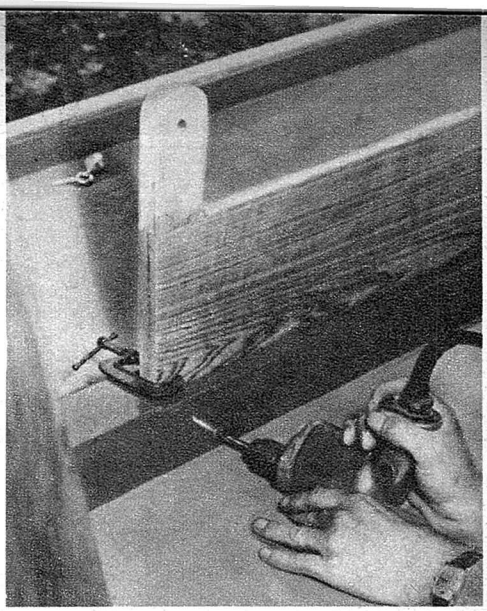
Now remove all parts and carefully mark them so they may be returned to their exact position. Pads are now back-bored to take heads of the ⅜-in. carriage bolts used to secure the cockpit to the hulls. These bolts are permanently fastened by means of a scrap of plywood glued and nailed over each head. Then all pads (including the two under the mast legs which bear no carriage bolts) are installed for keeps with glue and long galvanized finishing nails driven through frames and chines. Hull decks are glued and nailed down with brass nails. The ends of the six carriage bolts which secure the cockpit are projecting above the deck.

Returning to the cockpit: All splashboard and rail stock is half-gained to the plywood deck and miters at the corners are cut with the circular saw set at 45°. Where ends run through, as at the trailing ends of the front splashboards, exposed rabbets are plugged with a glued piece of scrap. The transom is ¾-in. lumber laminated with glue and nails to ¼-in. plywood which extends down over the back of the deck to act as a gained joint. Terrific strength results from cross-nailing the transom to augment the glue. It will take a 3 h.p. outboard motor with no further bracing, though a couple of reinforcing


SHEER HALF PLAN
11'-10"
23" 16" 16" 16" 16" 16" 16" 23"
A.P
F.P.
3/4" X 7/8" SHEER
STEM (SEE DETAIL)
3/4" X 7/8" CHINE
CHINE HALF PLAN
3/4" X 1-1/4" FRAMES
2-1/2"-1/4" PLYWOOD
3/4" X 7/8" SHEER
STERN POST
STERN LINER
STEM LINER
STEM
1-6"
BASE LINE
3/4" X 7/8" CHINE
CONSTRUCTION FRAMES
PLYWOOD FACE
REMOVE STUB LATER
FACE
SIDE
SCALE 1-1/2" = 1'-0"
CONSTRUCTION PROFILE
STERN SECTION
CUT TO PROPER LENGTH
BLOCK CLAMP
SHEAVE NOT OVER 2" DIAM.
WASHERS TO SUIT
PEEN TO LOCK
2-1/2" TO BEND
COUNTERBORE FOR NUT
5/16" X 1-1/4"
1/4" BR. OR GALV. STOVE BOLTS
16 GA. OR MORE BR. OR GALV.
BIPOD LEGS
BIPOD-LEG
INBOARD VIEW OF PORT LEG
FWD
TRIM TO MOULD
1/8" X 3/4" BR OR G.I.
9" X 3/4" ROUNDHD
3/16" SLOT
3/4" RAD.
NOT LESS THAN 1-1/2" X 1-1/2" X 1/8" BRASS OR GALV.
STEM & STERN LINER
5/16" NUT LOCK BIPOD
BIPOD
STEM
REINFORCING PAD
TILLER TOP (SEE DETAIL)
1-1/2 R. PIVOT POINT
STEPS
TILLER 3/4" STOCK
DRILL 1/4" FOR TILLER BAR
BLADE 1/8" TO 1/4" ALMN OR G.I.
3/16" OR 1/4" AS REQUIRED
RUDDER
PULLEY & BIPOD-MAST
BIPOD MAST
FWD
B L
AFT
COVER EDGES WITH 3/4" OVAL MOULD.
TILLER
A & C 1/4" PLYWOOD
B TO SUIT RUDDER
1/4" PIVOT BOLT
EYES SAWED FROM HINGE
BIPOD INSTALLATION
BIPOD HOOKS
LOCKED IN POSITION
ENGAGED FROM OUTBOARD
H'L'Y'D CLEAT
HULL
TILLER TOP ASSEMBLY
CUT ONE, REVERSE, USE AS TEMPLATE ON SAME PIECE 3/4" X 18" X 8' PLYWOOD
SCALE 1" = 1'-0"
BUILT BY KEITH VINING
PLANS BY WALTER A. MUSCIANO



The block clamp and pulley assembly is permanently fastened to the starboard leg of mast.



Align the centerboard pivot hole with that in the well as shown. Clamps rest on the well.

knees may be needed for a heavier motor.

The stub mast is built up to 1-in. thickness by laminating ¾-in. ply to ¼-in. ply. It and the centerboard well are preassembled into a unit with thick glue and screws before installation in the cockpit. Note that the sides of the centerboard well are ¾-in. stock, spaced 1 in. apart. Use a hard wood for these sides. Also note, in the elevation drawing, the projections extending beneath the base of the well. These are the stubs of the spacing blocks which serve to align the well with the centerboard slot in the cockpit. The whole assembly is completed with No. 9, 2-in. screws going through the cockpit floor and bow of the splashboard into the assembly.

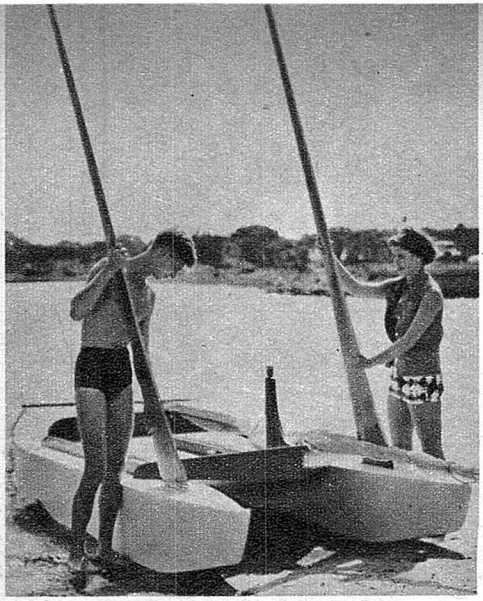
The stem and sternposts of the hulls have identical bevel, but the sternpost is shorter in section. The profile of the stem must be sawed before beveling to the preferred curve. This is optional, and many boat builders go into fancier shapes than that suggested in the drawing. The stern is straight and must be fastened with heavy screws (No. 9, 3-in.) as well as glue, for these are your rudder posts. The stem may be toenailed with No. 10 galvanized finishing nails deeply countersunk, especially if a strip of cloth, wet with glue, is laid up in the joint. When the glue drys, plane and sand it to final desired shape.

In making the tilting rudders, the first problem is that of hardware. Eyes may be cut from a large hinge, or fabricated from ⅛x½-in. strap. Holes should be as small as you can bend them in these fabricated eyes—probably ¼-in. since the larger pins are hard to come by. I used $\frac{3}{16}$-in. gutter-nails which are about 7 in. long and galvanized. They may be found up to ¼ in. thick and are cheap at your building supply house. The stern post hangers are drilled for screws and pins and bent from ¾x⅛-in. brass or galvanized iron strap.

Tilting blades for the rudders are cut from aluminum, if available. That shown was one half of a sheet of war-surplus Duraluminum purchased at a salvage store for one dollar. New aluminum sheet is slightly more expensive, but may be more easily found. In fresh water thin sheet galvanized iron will do, or even black metal if well painted. If no metal is available, the blade may be made of ⅜-in. plywood weighted with lead, like the centerboard. In the latter event, use at least a ½-in. thick middle lamination in the top of the rudder assembly.

After mortising the eyes in the rudder tops, mark for bolt holes through eyes and for the pivot of the tilting blade. Note in the illustration that the middle layer of the top is tacked to one side at this stage. After drilling holes through those two layers, assemble all three permanently with glue and shortened brass nails, and back-drill to align the holes.

Before assembly, pre-drill the tillers to take the bolts from the tiller bar. Assemble rudders, complete with tillers, to hulls and align for parallel. Get the correct distance between holes on the tiller bar at the rudder tops and drill one end of the tiller bar on the bench. Assemble with a bolt at that end (tiller bar underneath tillers) and drill down through the tiller at the other end to keep holes parallel. Then



Two young sailors demonstrate how quickly and easily King Kat's bipod mast goes into place.

Note extreme swing of the lateen sail. The sail won't touch the mast on either tack or reach.

remove the bar and bolt it securely on top.

Begin construction of the bipod mast by slotting the angles that go on the decks. Drilling a lead hole in each end, slots are easy to finish with a jig saw. Holes are drilled to take round-head No. 9, 1-in. screws every two inches in these angles. The hooks are cut and bent over a pipe to the dimensions shown. The curved portion of these hooks continues only part way round, so that they will engage the slots in the angle when each bipod leg is held slanting slightly outboard.

The legs themselves are sawed from ¾-in. plywood to the curve shown. Fore and aft edges are trimmed with ¾-in. screen molding (oval) fastened with glue and escutcheon pins. To assemble hooks to legs: Attach both hooks on one leg, only the aft hook on the other. Place the legs in the slots and tack the tops together with the edges even. The other hook is then placed and held in position with a C-clamp until the screws are driven home. This assures perfect alignment.

The halyard block is also the clamping bracket that holds the legs together at the top in such a manner that they may be disassembled with removal of one $\frac{5}{16}$-in. nut. This block-clamp is fabricated around any available pulley wheel not over ½-in. thick x 2 in. diameter. First bend the 2-in. strap over a wooden block which has been planed to radius. Leave the block between the sides of the strap to drill through for an aligned axle. The end of the bolt that forms the axle is peened over to lock the nut. The clamp is attached to one leg permanently and the bolt which joins the legs in permanently fastened to the clamp with a nut. The other leg is counterbored on the inside to receive this nut. A second removable nut and washer are used on the outside. The hinge from the boom to the yard is cut from waste metal left over from the tilting rudder blades. A heavy screw acts as a pivot here so that the yard can be turned over occasionally to prevent it from setting into a curve.

The centerboard is built up out of ¾-in. lumber and weighted with about five pounds of poured lead. Drive nails around the inside edge of the hole before pouring the lead to lock it in place.

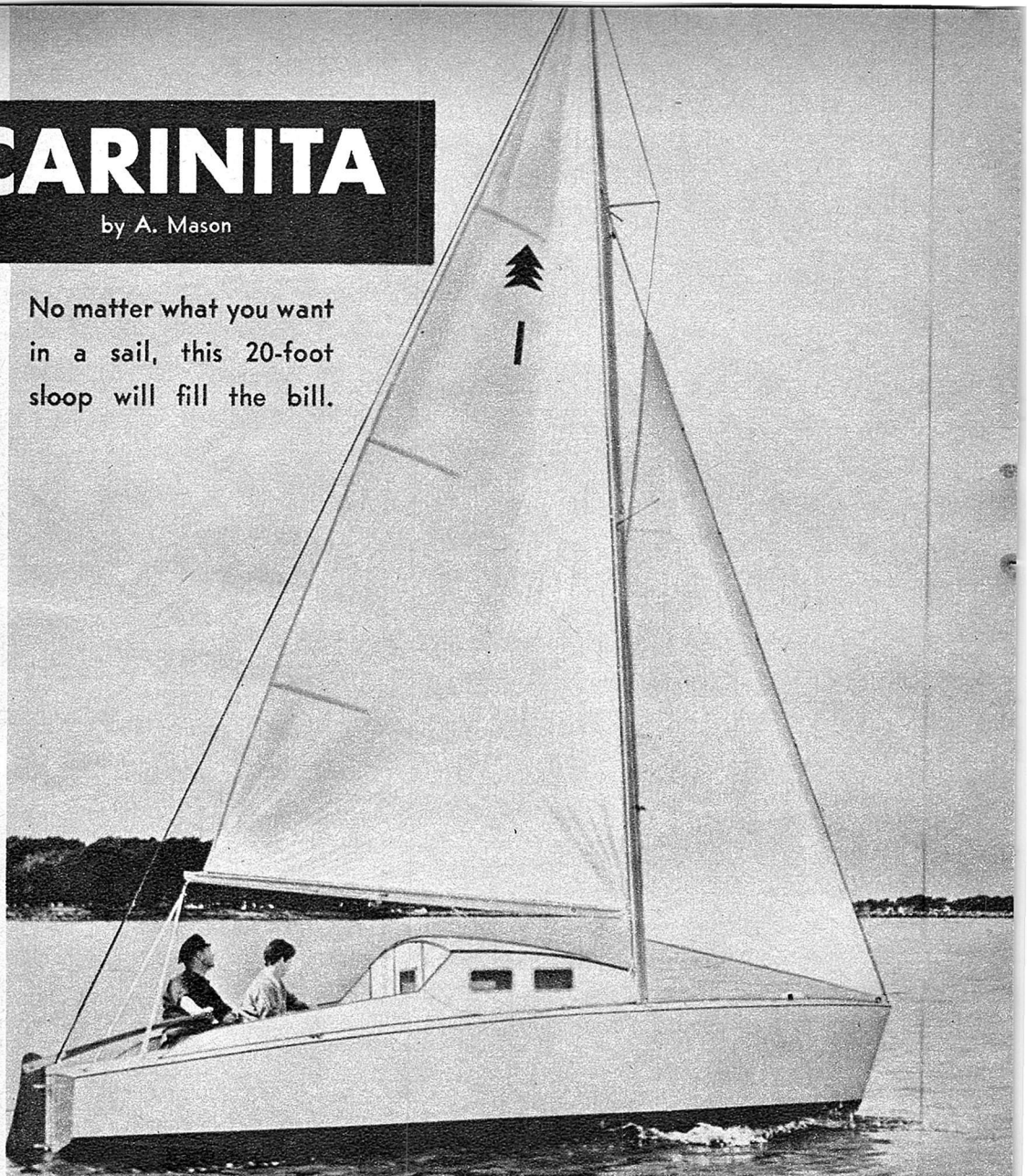
Vent plugs are necessary in these sealed hulls because of air expansion when the boat is beached in the hot sun. Glue small blocks to the deck and drill for No. 00 medical stoppers which are synthetic rubber. These lock with a string and nail dropped through each hole. Painting is conventional, at least three coats rubbed down between. Use bottom paint below the waterline if the catamaran is to stay in the water. Spars should be given three coats of good grade spar varnish.

Happy sailing in King Kat. If you ever turn this one over—which would take some doing—you needn't worry. It won't sink. •

CARINITA

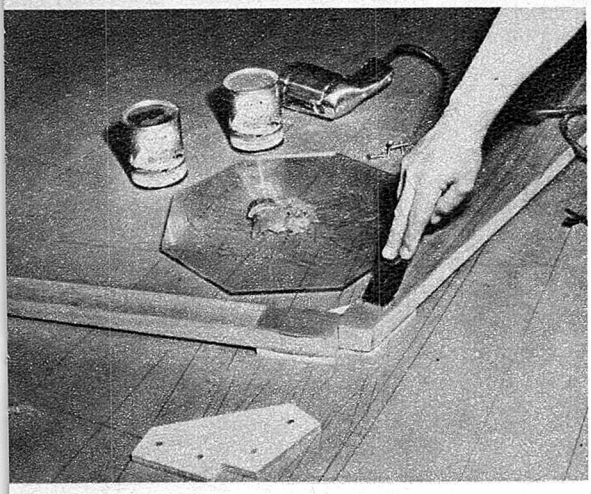
by A. Mason

No matter what you want in a sail, this 20-foot sloop will fill the bill.

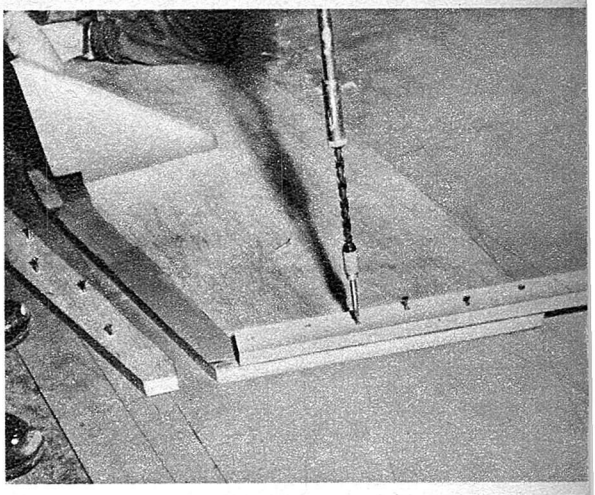


CARINITA was designed for the amateur builder who desires something more than a typical day sailer, not a full cruising boat but a fast sailboat that has limited accommodations sufficient for an occasional overnight cruise yet without the higher building costs associated with keel boats of this size. While two fixed berths with lockers and shelves for food, dishes and stove are provided, there is also ample stowage space for a portable icebox, a watercloset of the bucket type for economy's sake, sails, water bottles and all the other equipment one usually requires for an overnight cruise.

Carinita will be exceptionally seaworthy and her full beam at the waterline will provide sufficient stability to withstand any normal sudden summer blow. With certain modifications to the cockpit and cabin entrance Carinita would be eligible to meet the requirements of the English Royal Ocean Racing Club Junior Offshore Group, more commonly known as the J.O.G. class, as well as the American Midget Ocean Racing class. This class is a logical de-



Frames are assembled on the full-size plans. Coat of bonding agent adds to frame strength.



When fastening transom framework to transom planking, space the screws four inches apart.

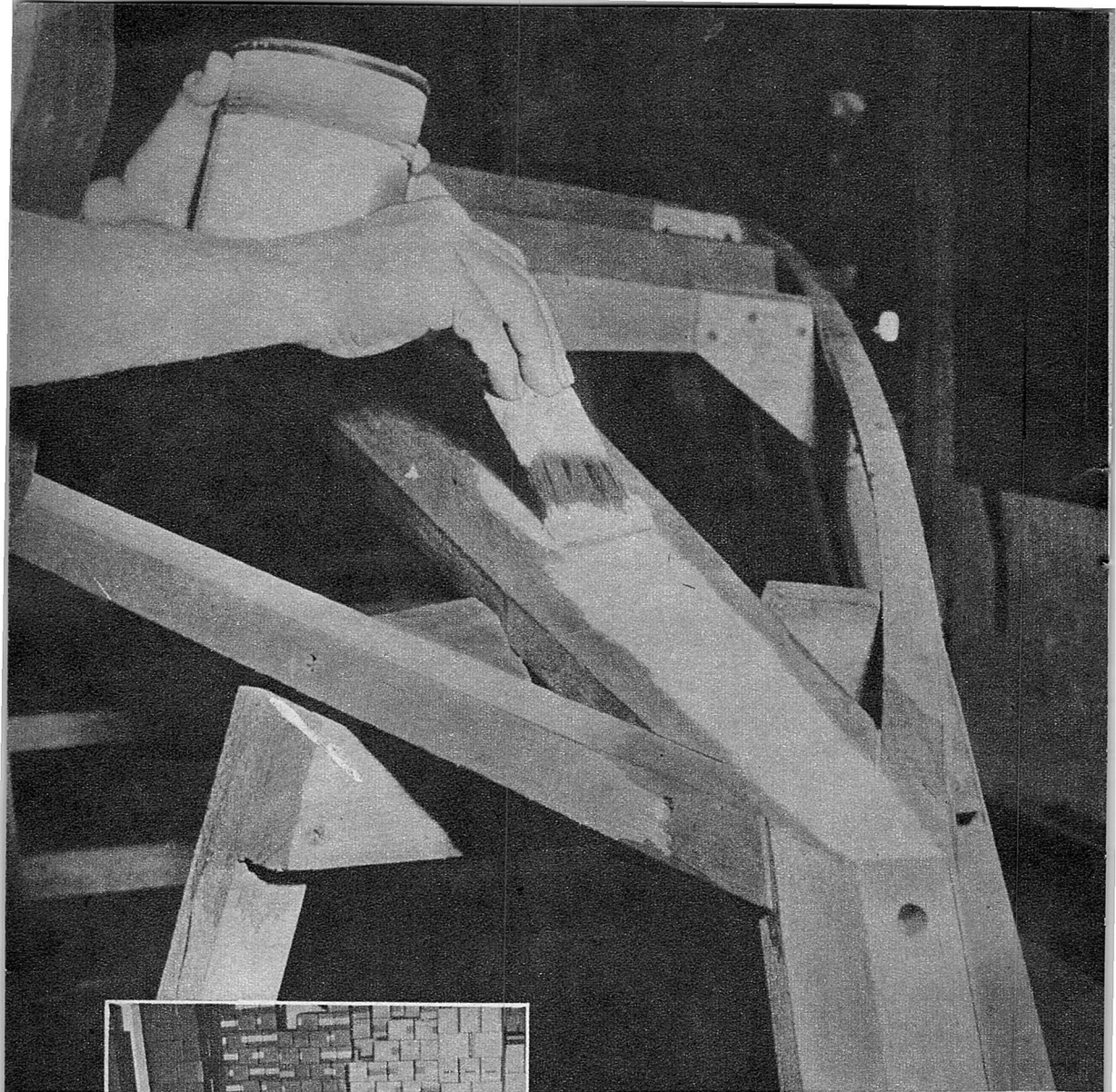
velopment in these days of high costs for those who wish to participate in the shorter ocean races. Except for the required modifications noted above Carinita is very similar in appearance and size to the Sopranino, the initial boat of this class, that has crossed the Atlantic from London to New York by way of the West Indies. Carinita has much greater sail area and a more comfortable cockpit to suit normal American sailing conditions.

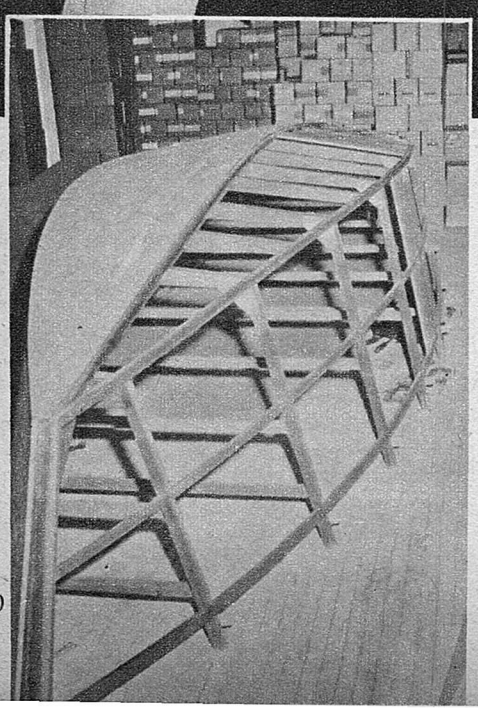
Incidentally, while some will be in a position to make up the keel pattern and have it cast, the keel is very similar to that of the International Star class as to outline and weight, only slightly heavier. Considering the large number of approved Star keel patterns around the country in various foundries, it might be possible to obtain a surplus Star keel at a considerable saving in cost, particularly if it is overweight or did not meet class inspection. Even a lightweight Star keel would be satisfactory.

Carinita's modern Marconi rig has been kept simple, but assures proper balance for light and heavy winds by the alternate headsails shown, besides having excellent handling qualities under sail. The sail and rigging plan is simple and similar to that of the Lightning class, with the working sails (jib and mainsail) and spinnaker the same size. With the exception of the mainmast and the length of the standing rigging the spars and deck fittings are the same. However, the mainmast had to be slightly longer due to the greater bury in the hull and in order that the boom would clear the deckhouse and still have the luff of mainsail the same length. Consequently the lengths of all the standing and running rigging are slightly longer.

Actually the principal advantage of this arrangement is purely to the benefit of the average amateur's pocketbook since it should be possible to obtain a used set of sails that has seen its best racing days but is perfectly satisfactory for day sailing. Or standard sails may be obtained from a sailmaker. In either case one should be able to obtain a suit at a considerable saving over the cost of a custom made suit of sails. The Genoa jib and storm jib are not a part of the Lightning suit of sails. As these are luxury items they must be custom made and can always be added at a later date when serious racing is contemplated. The Lightning class symbol cannot be used on the sails as it is a registered trade-mark and must be removed.

For those who have never built a boat before, Howard I. Chappelle's *Boat Building* or Robert M. Steward's *Small Boat Construction* will be handy reference volumes to have around. Both are obtainable from The Rudder Book Department. They may save many hours of misdirected effort and wasted materials. If the material and equipment weights are kept to the absolute minimum it may be necessary to stow a small amount of inside ballast to put the boat in proper racing trim when the crew is aboard. Since the weights always seem to build up rather fast it cannot be overemphasized that all the materials, especially those above the waterline, should never exceed in weight those indicated on



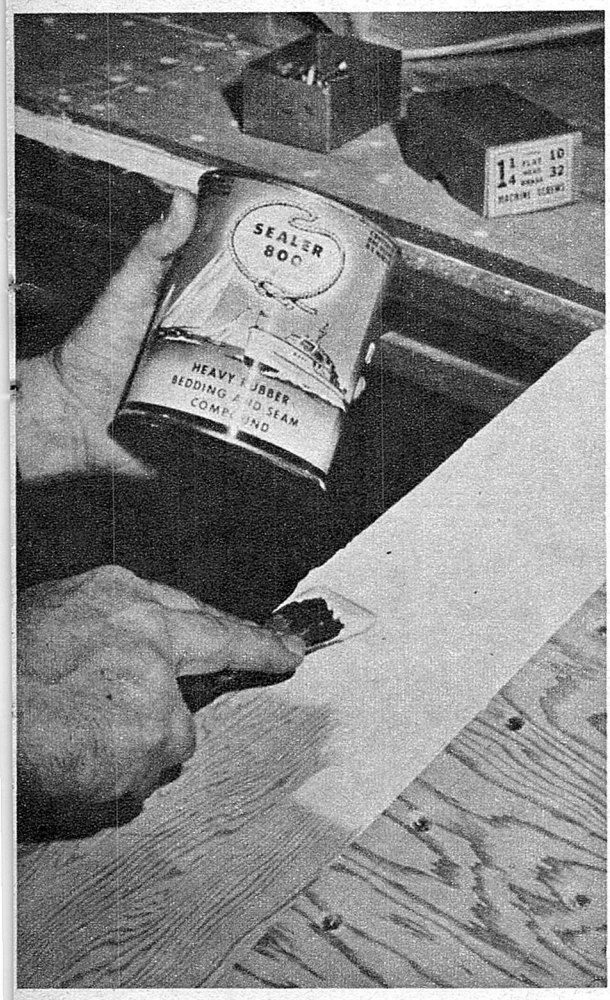


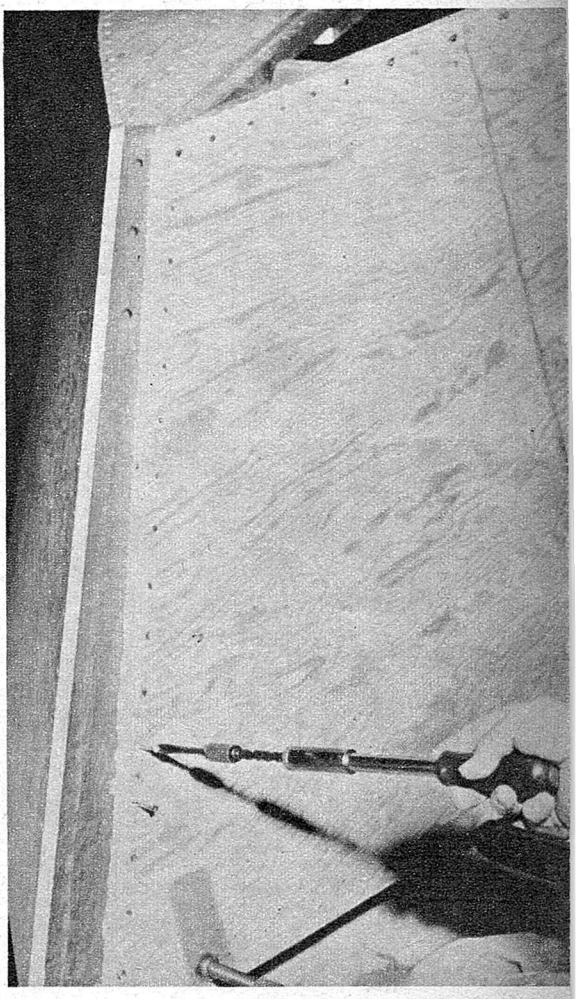
Careful builder (above) uses sealer to create an adhesive seal between inner and outer keel. Planking (left), fitted and cut, is fastened with one-inch screws placed about two inches apart.

the plans if top performance is expected.

Before starting to build study the bill of materials and check it against the plans in order to become thoroughly familiar with the required quantities. Mahogany plywood should be solid mahogany and not merely mahogany faced. There have been too many cases of the center cores of mahogany faced plywood dry-rotting completely away to leave only a thin shell that eventually collapsed. If only mahogany

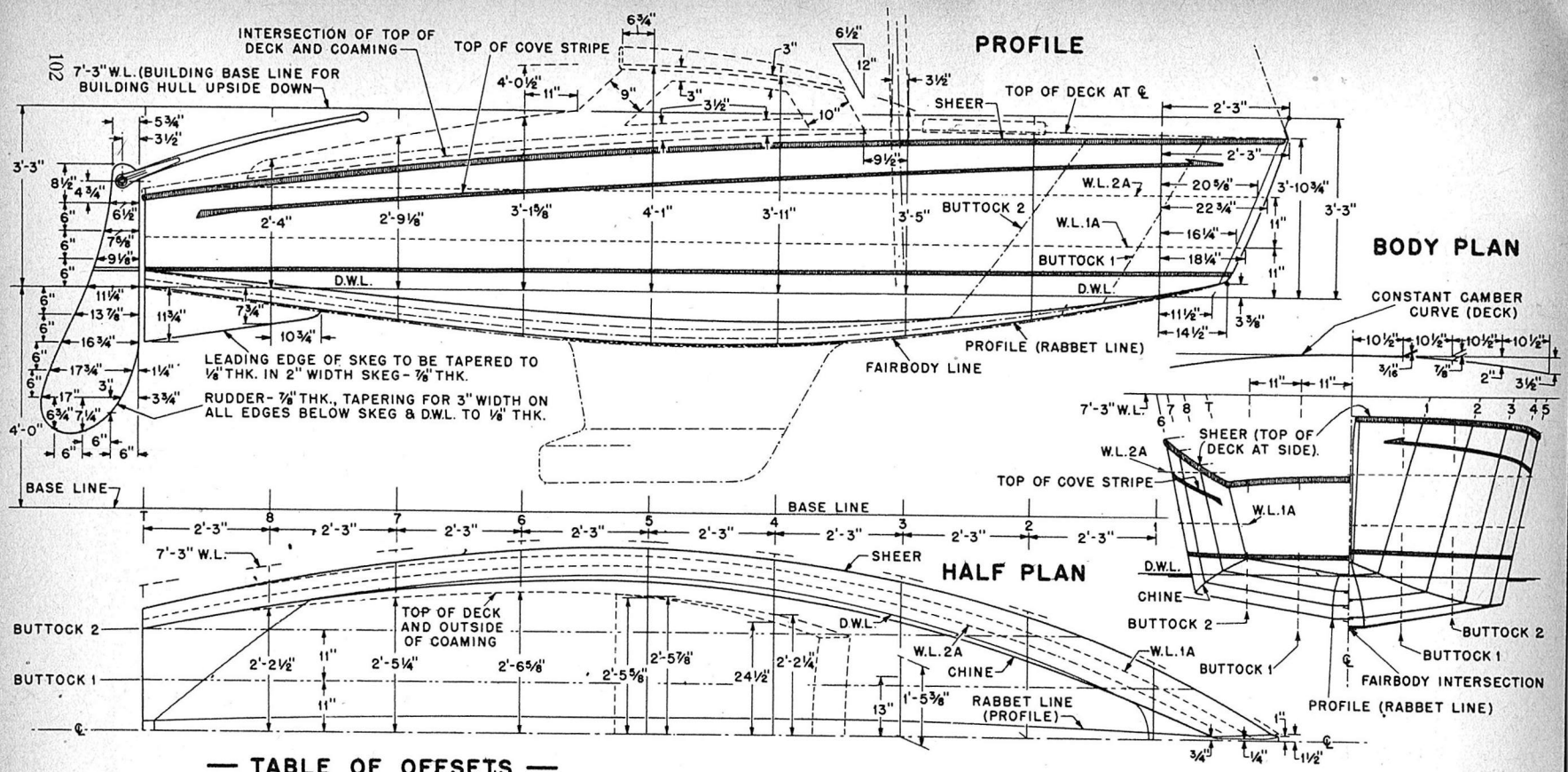
Apply bedding compound (left) along all seams and at butt joints which are fastened with double rows of bronze bolts. After the side plank has been carefully fitted at the stem (right), back the screws out, apply glue to the framework, cover with cloth strips, then replace plywood and redrive all screws.





faced plywood is available it is much better to use Douglas fir plywood that is edge-branded EXT-DFPA. All screws and bolts should be silicon bronze (Everdur) or equal, except that galvanized steel bolts (or hot dipped galvanized iron) should be used for attaching the keel.

Lay down the full size lines of the hull, taking the required data from the lines drawing and the table of offsets and proceed in accordance with the instructions given in a boat building manual. For drawing each frame pattern use a large sheet of wrapping paper folded in the middle so the fold line will represent the centerline. Lay out the side and bottom frames with the double chine knees on one side according to the general requirements shown on the drawing. Punch through at the important points, unfold, and draw the other half. As there are only a few very slightly curved frames in the bottom forward, all that is necessary is to lay the 2-inch frame material over the patterns and mark the correct lengths and bevels. All measurements for the chine knees are taken from the frame patterns and when all the parts have been made and checked they are assembled and fastened together with 1½-inch No. 10 flathead wood screws or 2-inch No. 10 machine screws or carriage bolts as preferred, checking the outline of the

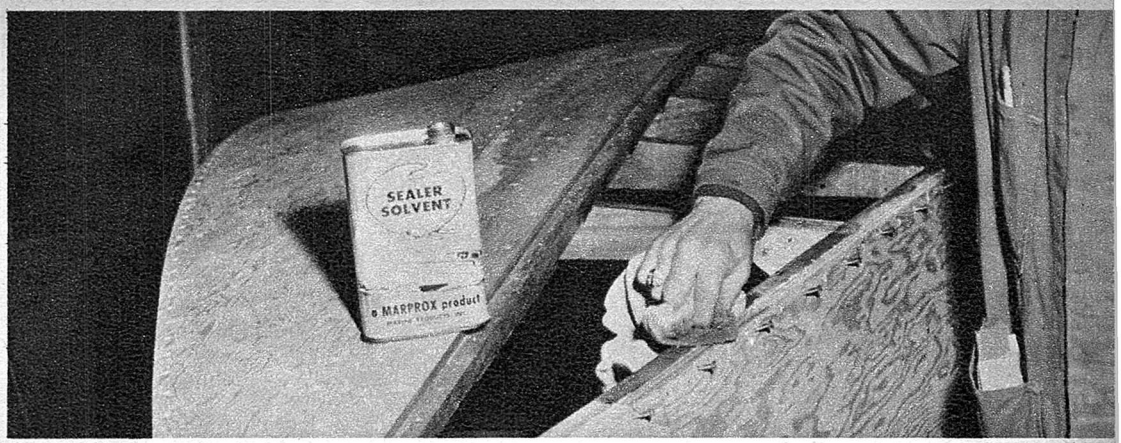


— TABLE OF OFFSETS —

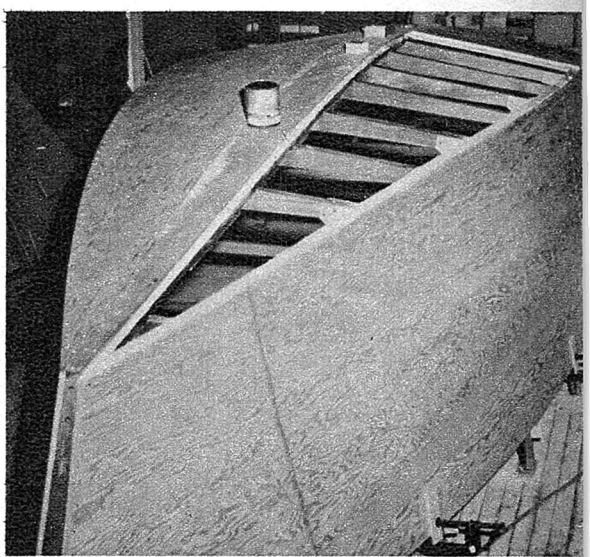
DIMENSIONS GIVEN IN FEET, INCHES, AND EIGHTHS OF INCHES TO OUTSIDE OF PLANKING (OR TO TOP EDGE OF DECKING).

FRAME NUMBERS	1	2	3	4	5	6	7	8	T
—— HALF BREADTHS FROM CENTER LINE ——									
7'-3" WATER LINE	1-4-6	2-3-4	2-10-6	3-3-3	3-5-5	3-5-6	3-3-4	2-11-7	2-7-3
SHEER (TOP OF DECK AT SIDE)	1-3-5	2-2-2	2-9-5	3-2-1	3-4-3	3-3-6	3-0-6	2-8-3	2-2-3
CHINE	0-6-2	1-4-5	2-0-6	2-6-2	2-8-7	2-8-7	2-6-7	2-3-2	1-10-0
RABBET LINE (PROFILE)	0-1-3	0-2-5	0-3-3	0-3-4	0-3-4	0-3-4	0-3-3	0-2-7	0-2-0

FRAME NUMBERS	1	2	3	4	5	6	7	8	T
—— HEIGHTS ABOVE THE BASE LINE ——									
SHEER (TOP OF DECK AT SIDE)	6-10-4	6-10-1	6-9-5	6-8-6	6-7-3	6-5-3	6-2-6	5-11-4	5-8-1
TOP OF COVE STRIPE	6-5-0	6-4-0	6-2-6	6-1-2	5-11-5	5-10-0	5-7-7	5-5-7	5-3-0
CHINE	4-0-5	3-8-5	3-6-4	3-5-6	3-6-1	3-7-7	3-10-2	4-0-7	4-3-5
BUTTOCK 2			3-6-1	3-4-3	—	—	—	—	—
BUTTOCK 1		3-7-5	3-4-3	3-2-3	—	—	—	—	—
FAIRBODY LINE	4-0-0	3-6-5	3-2-6	3-0-4	3-0-2	3-2-1	3-5-1	3-8-3	4-0-0



Use a solvent (above) to secure a smooth sealer base on bottom edge of chine and keel-rabbet. When keel-rabbet, chine and butt-plate (right) have been coated with sealer, final bottom planking (lower right) is installed, lapping over side planking, after which screws are driven home.



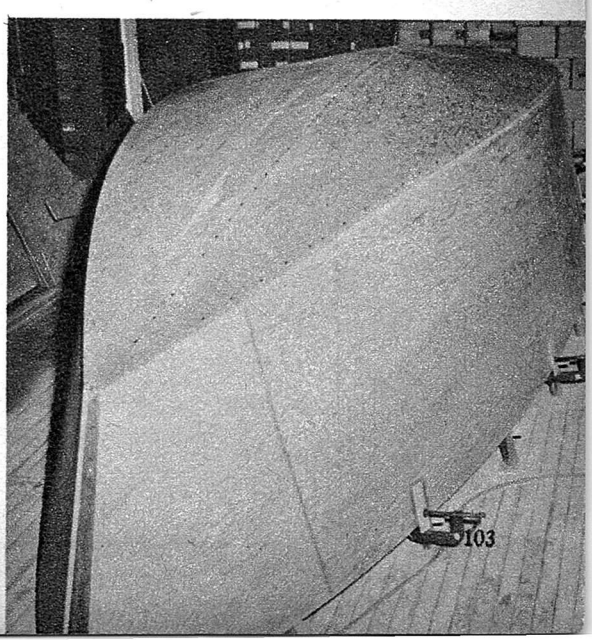
assembled frame against the paper patterns. The fastenings should all be set in sufficient distance to allow for the chine logs and beveling the frames. After thoroughly checking the frames by adding temporary cross and diagonal braces to maintain accuracy and hold the frames in shape, the notches for the keel, limber holes and gunwales can be cut.

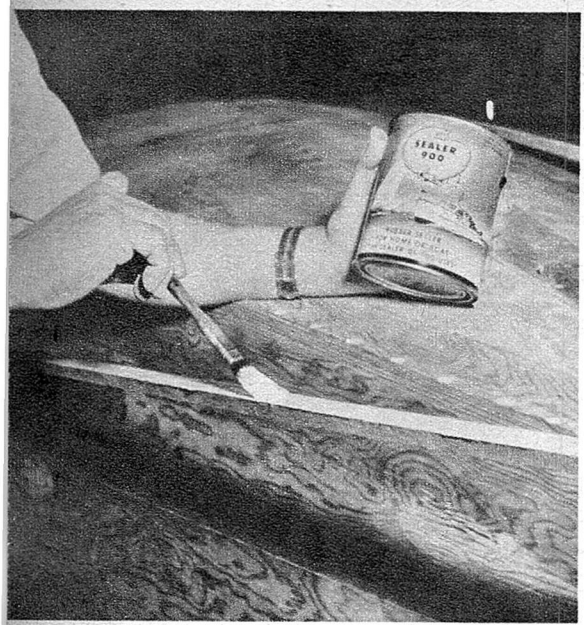
The transom framework is fastened to the transom planking with 1¼-inch No. 8 screws spaced about four inches apart, with all contacting surfaces coated with marine glue or thick lead paint before fastening together. Only the transom framework should be notched for the keelson, chine logs and gunwales.

The stem is in two parts to avoid rabbeting. When checking the inner stem over the full sheer line for fastening the stem to the floor when the boat is set up, it is only necessary to partially bevel the stem since the final bevel will be cut after the boat has been set up and faired so that the outer stem will completely cover the end of the planking.

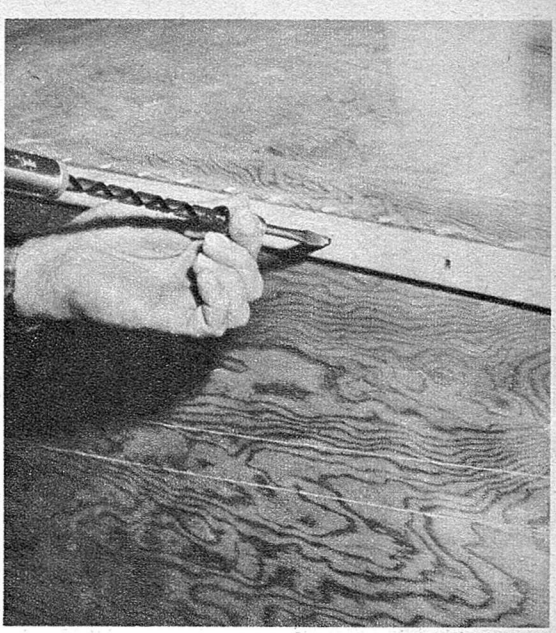
The boat is intended to be built upside down on a firm level wooden floor that measures not less than 11 by 22 feet. Prepare the floor by applying a cheap grade of water paint. On this lay out the boat's centerline and the other lines at right angles to it that represent the molded frame lines.

The transom and frames are now set up.

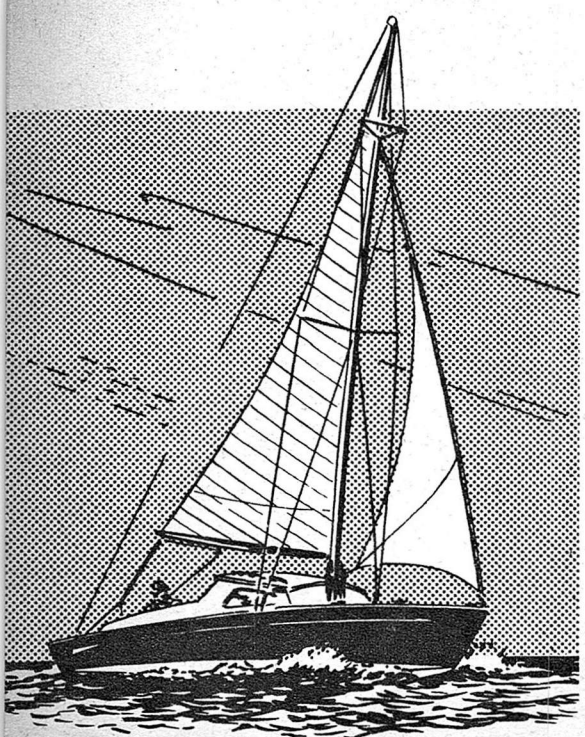




A coating of rubber sealer is carefully brushed onto the inner side of the chine batten to completely cover the edges of the plywood at the chine.



The chine batten is now screw-fastened into place. Countersink the screws and cover them with wood dough. Note the scribed lines for the boot-top.



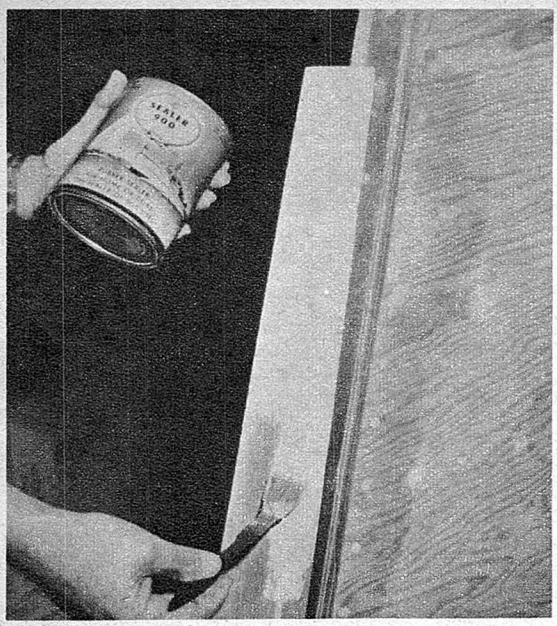
This is done by attaching the frame heads to the floor with the molded line of each frame located as shown in the drawings. (In general, the molded frame line is the wider side of the frame after the bevels are cut). Each frame is then secured in position at the proper rake by adding temporary battens and bracing.

Bend the inner keel in the notches provided for it and fasten to each frame with a countersunk ¼-inch diameter carriage bolt on the centerline. Set the stem up and secure to the inner keel as shown. Add the chines, fastening to the frames with a 1¾-inch screw.

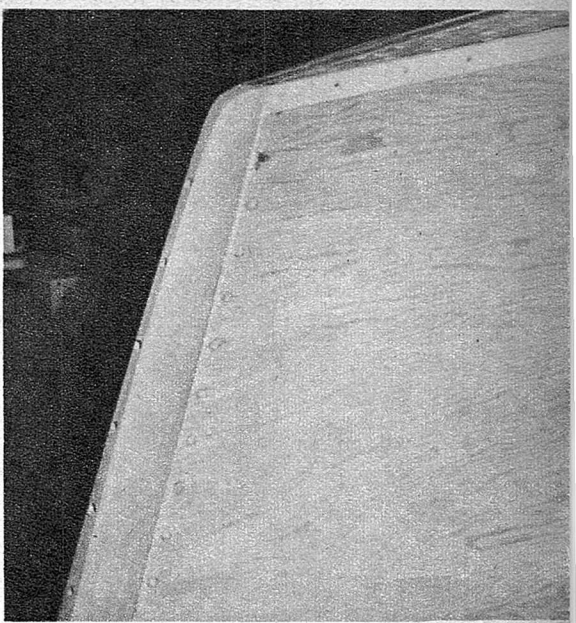
Next notch the frames for the clamps and fasten to frames with one 1¾-inch flathead screw each. The longitudinals are temporarily clamped in place at about the locations shown and marked, then they are removed and the notches cut. Fasten each longitudinal to each frame with one 1¾-inch screw.

The framework is now trimmed, faired and beveled with a plane and wood rasp. All fastenings are recessed and all voids are filled so plywood planking will touch evenly at all points. Check the fairing and beveling frequently by springing fairly small stiff battens around the structure.

Next comes the planking. Obtain a



The inner face of the outer stem also is coated with the sealer which automatically creates an adhesive seal between the inner and outer stems.

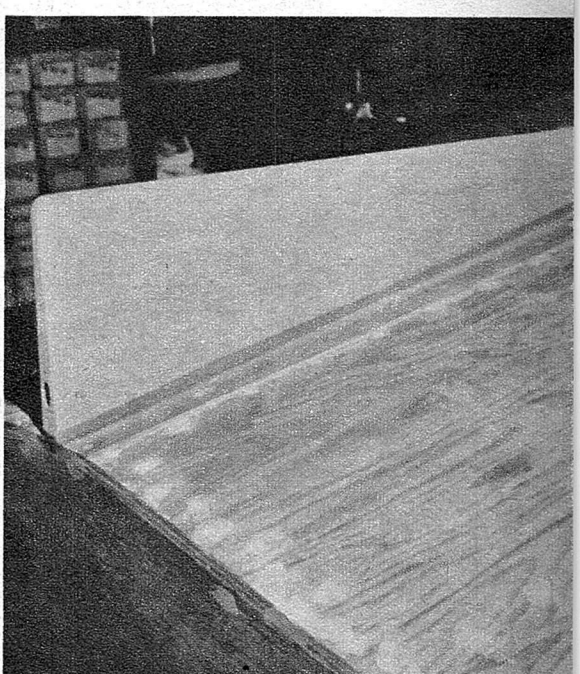


When the outer stem is fastened into place, a squeeze-out of excess sealer may occur. Wipe off all excess immediately with a damp cloth.

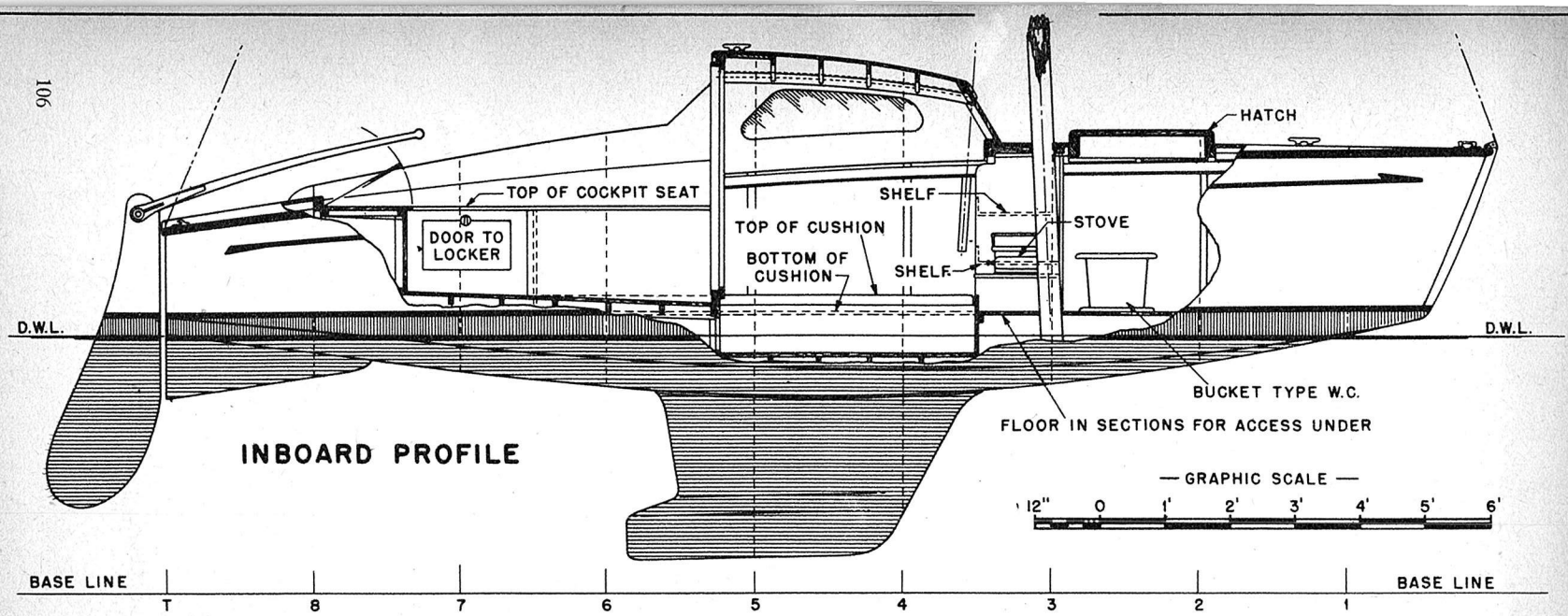
panel of inexpensive plywood and use it to make templates for the sides and bottom. Put the sides on first, starting at the bow and using 8-foot panels. Carefully fit each template, then lay it on good plywood, mark and cut out. Secure the planking with one inch screws spaced about 2 inches apart.

Where two panels meet install a butt strap between the chine and clamp, temporarily fastening it in place. After the side planking has been satisfactorily fitted and screw fastened, back the screws out, apply glue to the framework, lay cloth strips on the glued areas, replace the plywood and redrive all screws. Fasten the butt straps to the planking with clinched shingle nails.

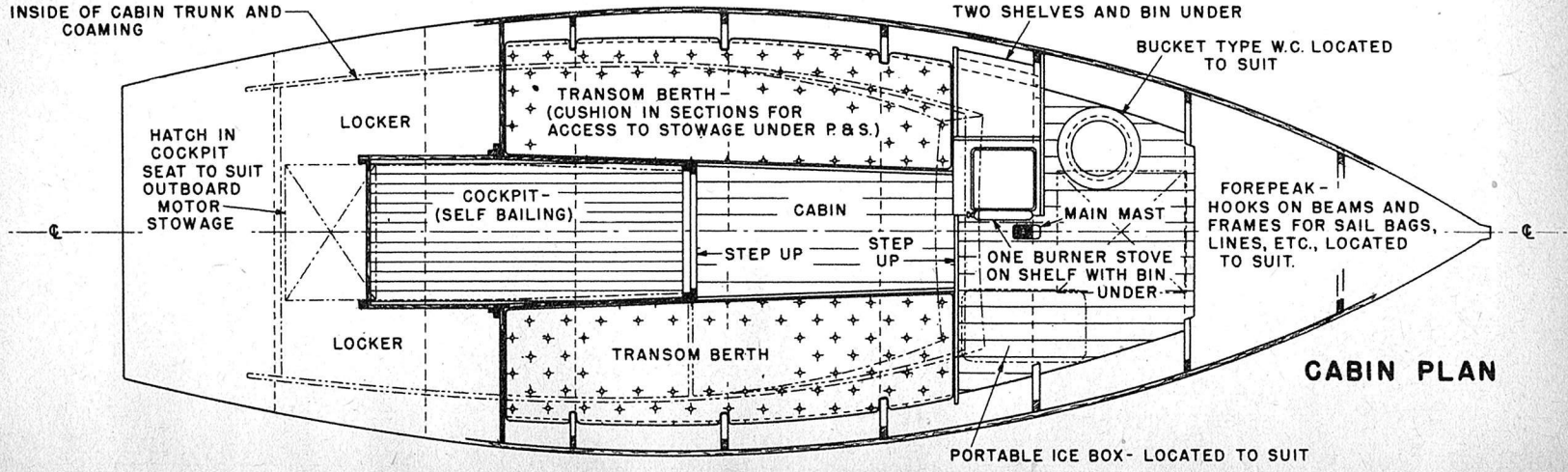
Install the bottom planking in a similar manner to lap over the side planking, laying the 8-foot panels from the after end of the boat so the butt straps on the bottom will not be near those on the sides. The bottom straps should be continuous from inner keel to the chines. Notch the bottom longitudinal as required. It might be helpful when bending the bottom in place at the stem to soak it in hot water or steam it before applying it the first time. If this is done allow the bottom to dry out thoroughly before removing it to apply the glue.



The skeg is fastened into place with bronze screws from inside the keel. Countersink the screws, cover with wood dough and sand smooth.

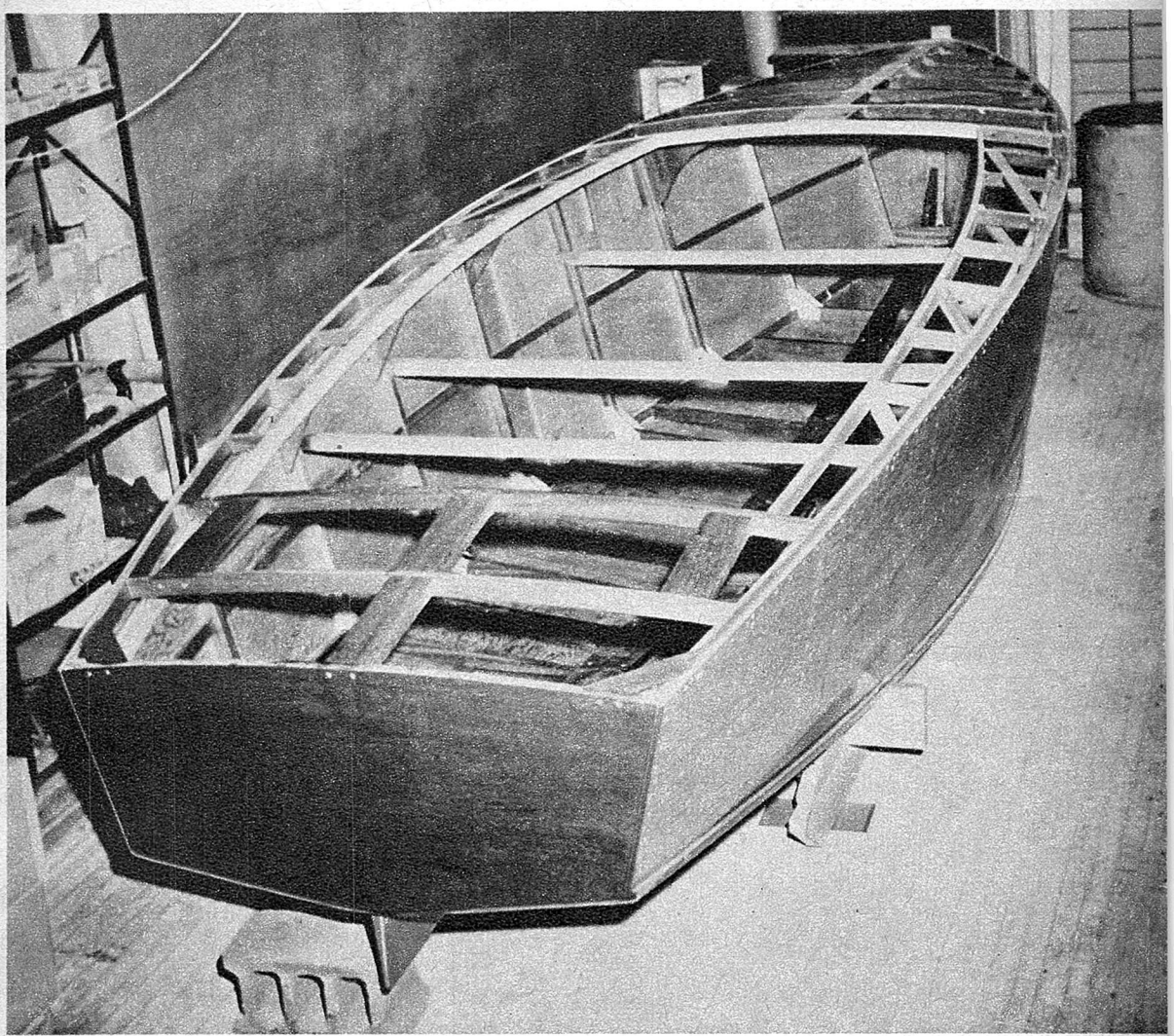


INBOARD PROFILE



CABIN PLAN

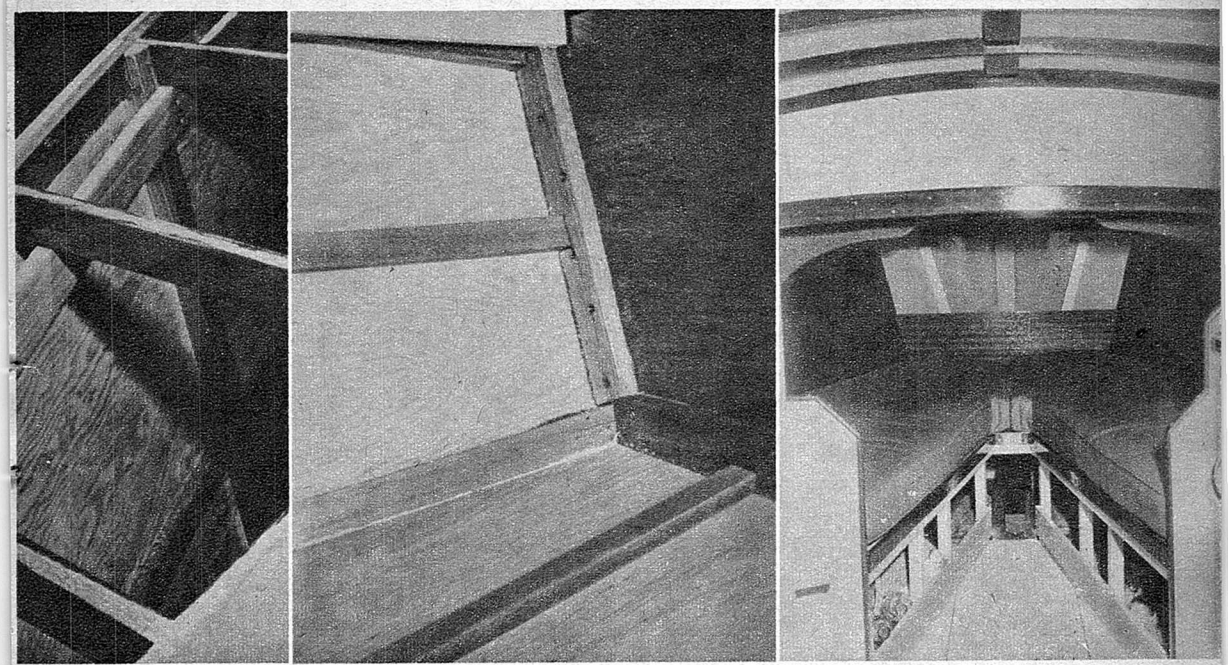
View of the deck framing from astern. Note that amidships cross braces are still in place.



To protect the raw plywood edges where the bottom laps the sides, the outer chines or spray strips are fitted, setting them in nonhardening marine bedding compound and thoroughly fastening them. The exposed edges of the plywood along the stem and keel are covered with an outer stem and keel, securing it with 1¾-inch screws on 6-inch centers. It might be necessary to make this piece more pliable by boiling or steaming it for half an hour before installing the member.

Now turn the boat over and set it on two well-padded supports. Remove the cross-braces, install the clamps, deck stringers and deck framing and cut off the frame projections. Trim and fair the beams, clamps, stringers and frame heads to take the plywood decking, but before doing so install the cockpit sides and ends and thoroughly fasten all to the corner posts, headers and deck framing.

The hull is now ready to be fitted to the iron fin keel which may require a thin wood shim which must be kept to a minimum. Before bolting together place a heavy layer of felt soaked in thick paint or a thick layer of 3M Minnesota Mining



Marprox Epoxy-Resin (left) is applied to the king plank and the deck beams to form a rigid, immovable bond between the plywood decking and the deck beams and king plank. Sealer (above left) is used to provide a flexible watertight seal at the joint of the sheer and plywood decking. The decking is applied immediately afterward. Interior view (center) showing the construction at the starboard corner of the transom. Sealer squeeze-out should be wiped off immediately. Interior view (above right) showing the two berths. The mast prop has been removed and is stowed under the forward end of the berths.

Compound between the iron keel and the wood keel. The ballast keel bolts should be galvanized iron or steel set up tight with rubber or leather washers under the metal nuts and washers on the inside of the hull.

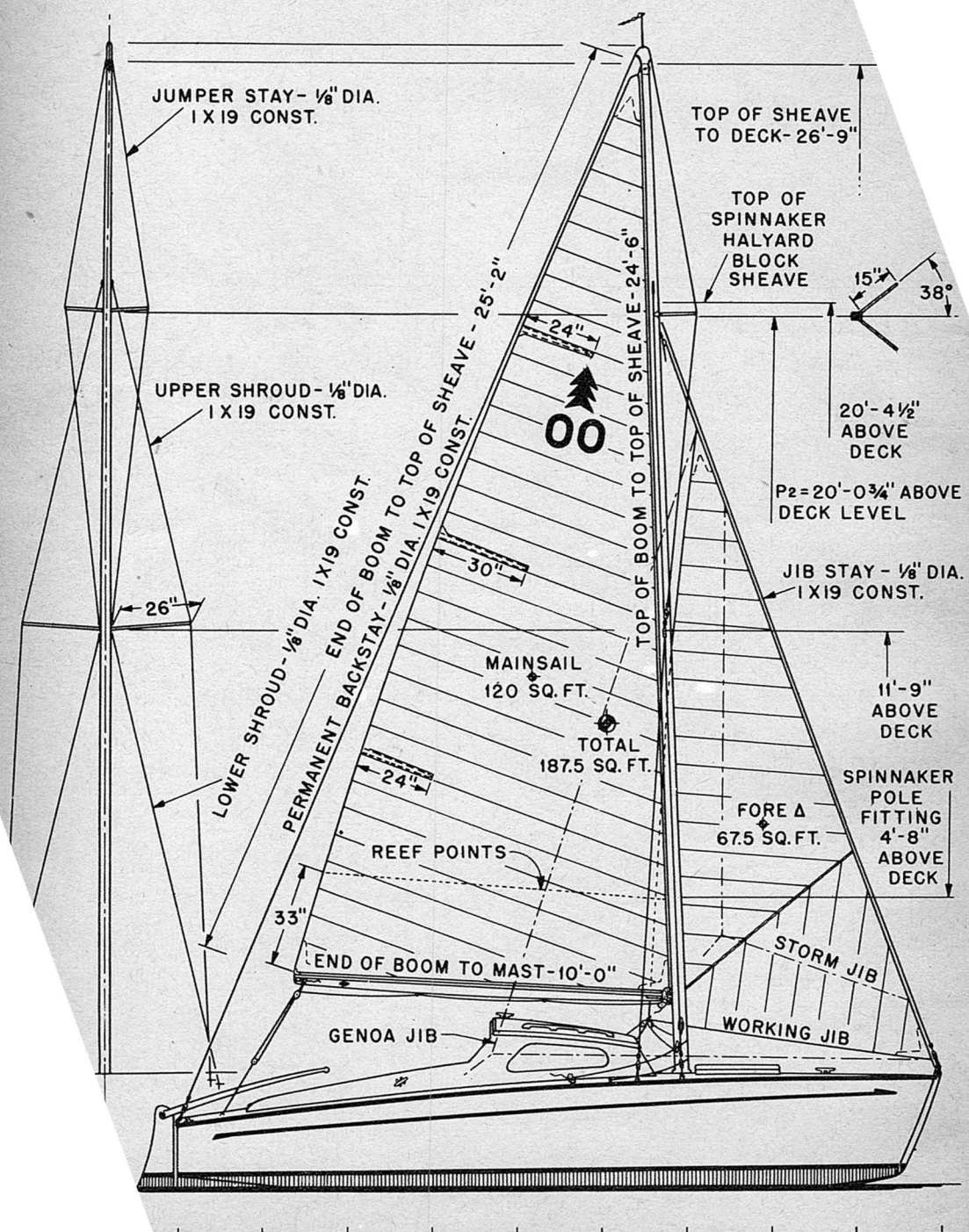
The rudder and tiller are now made up and fitted to the boat, using a standard set of Lightning class gudgeons. In any case the rudder fittings should be amply strong and there should be some means to keep the rudder from lifting off.

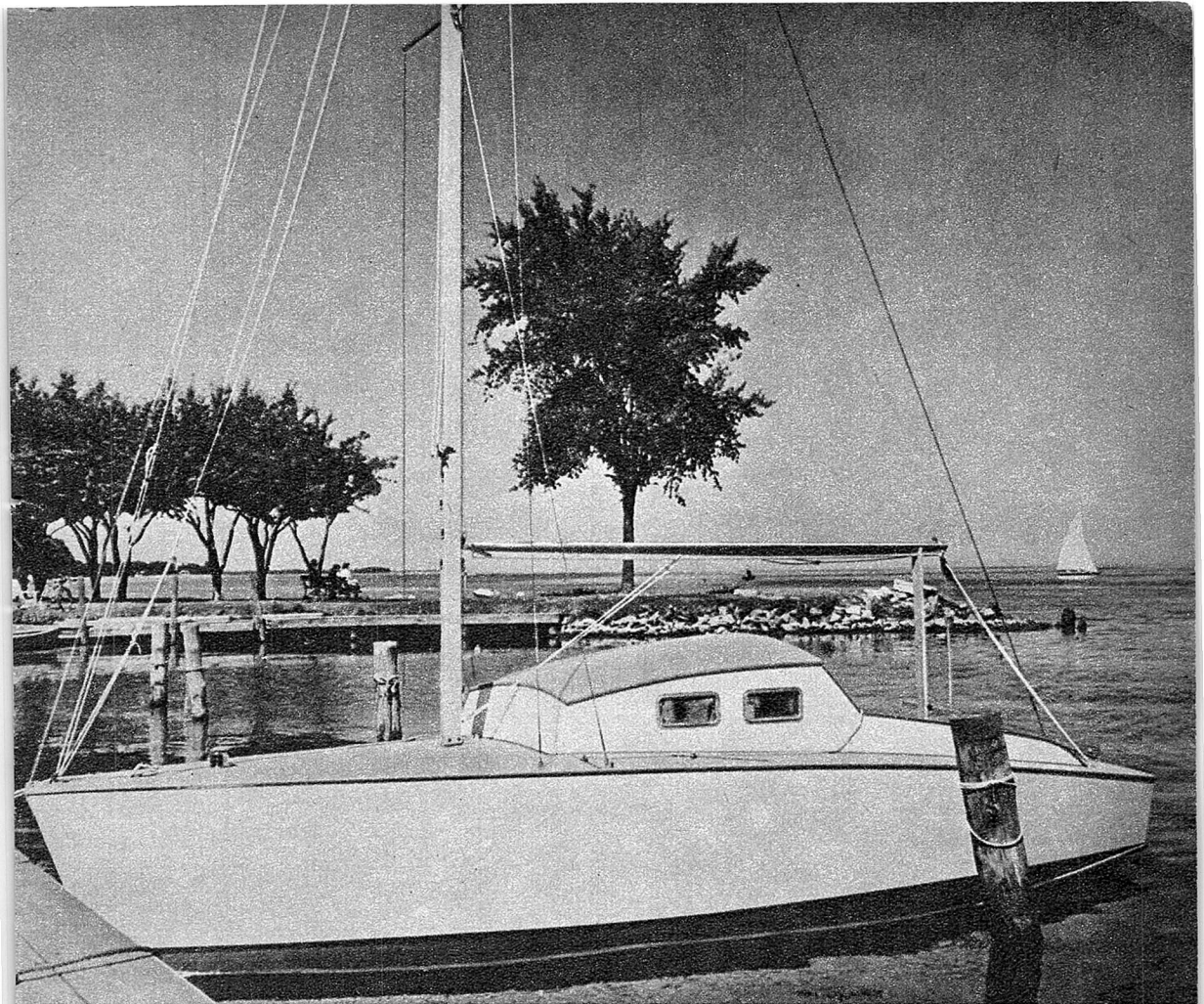
As previously noted, the spar and rig design is simple and requires little explanation. The mast is of the usual box construction, which is about the strongest as well as the lightest and simplest type for the amateur to build. The main pieces of the spars are glued together, using casein or Weldwood glue, without any other fastenings as they are unnecessary and only add weight. The arrangement of the spreaders and various stays and shrouds is to be carefully followed. As for the sails, nothing need be added except that the reef points should be reinforced grommets and when it becomes necessary to reef, which should be relatively seldom, a lace tine should be used.

The remaining joinerwork, spars, etc., can now all be added. Except for a thorough sanding Carinita will be ready for painting and varnishing. The hull should be given two coats of Cuprinol or an equivalent rot resisting preservative. All plywood should have two coats of plywood sealer inside and out. Apply at least three coats of good marine paint or varnish to the entire boat, in strict accordance with each manufacturer's instructions.

After all the paint is dry the hull is ready

RIGGING AND SAIL PLANS





The completed Carinita awaits its maiden voyage. The sails have been removed to show the rigging details.

for the deck hardware and other fittings. As these are matters of individual preference it need only be said that all unnecessary items add weight. So unless there is a definite use for a fitting do not add it. Too many fittings, especially of the chrome plated variety, create a distasteful sense of gaudiness or cheapness that has no place in a boat of this type. Those shown are the barest minimum for handling the working sails. Additional fittings will be required for handling a Genoa jib or spinnaker when racing. For night running self-contained battery lights are the most satisfactory and these should be attached to removable light boards fastened to the shrouds on each side. As for any other special equipment outside of the required government items, these can be a matter of personal preference. But in no case should the boat be loaded down with a lot of extra equipment that is not necessary.

As mentioned before, the amount and proper position fore and aft of the inside ballast is to correct the flotation of the boat and may preferably be lead pigs, but if iron pigs or sash weights are used have every piece thoroughly coated with hot pitch. In any case the ballast should rest on thin battens for drainage between the floors and should be secured against shifting with more battens and sufficient chocks. •

THE H 28

by L. Francis Herreshoff

Living is easy and sailing is fun when you head out to sea aboard this 28-foot auxiliary cruising ketch.

H 28 was designed for the man who has only a limited time to sail, but would like to go somewhere and back in that time. It was designed to be a boat that could be quickly gotten under way for a sail on a summer evening, a boat that could ghost along in light breezes as well as stand up to anything she might get caught out in along our Atlantic coast in the summer time. She is wider on deck than an ideal sea boat should be (particularly aft), but that is to secure maximum deck space and to make her drier in a chop.

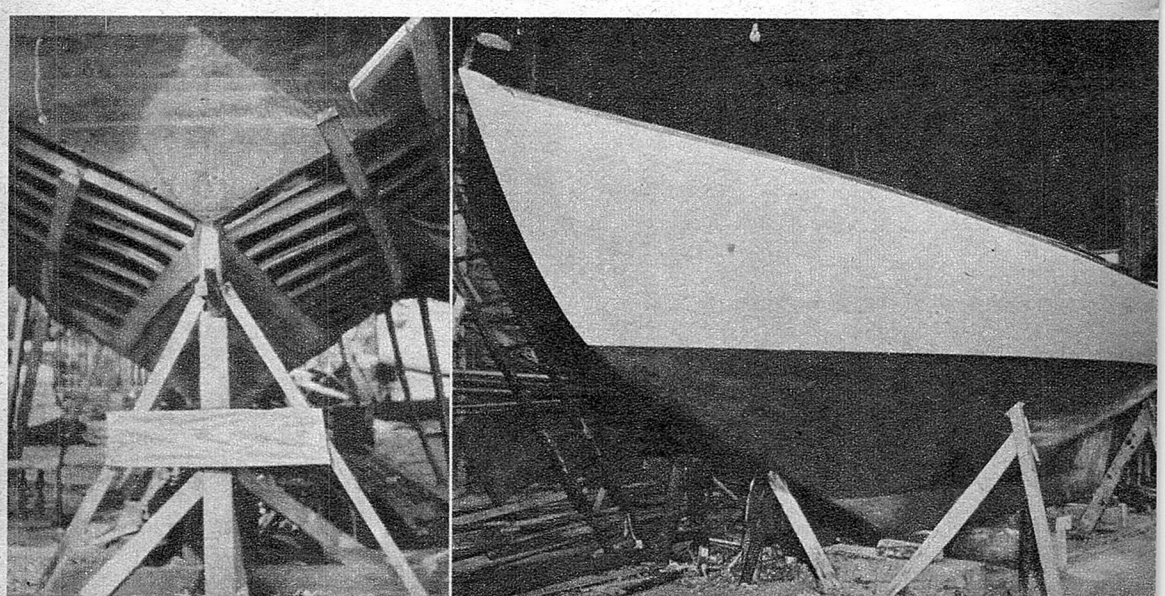
Some of the principal objects of the design are to secure the maximum usable room for the cost without sacrificing looks and speed, and to have the boat of as simple construction as is consistent with strength and long life. Whereas it is often said that a vee bottom boat is easy to build because the frames are straight and don't have to be steam bent, still in the end the work amounts to nearly the same, for a vee bottom practically has to have three keels (two chines and a keel) and many more joints to make watertight or they are apt to give trouble. A boat shaped like H 28, if half carefully built, should stay entirely tight even if exposed to considerable strain or twisting.

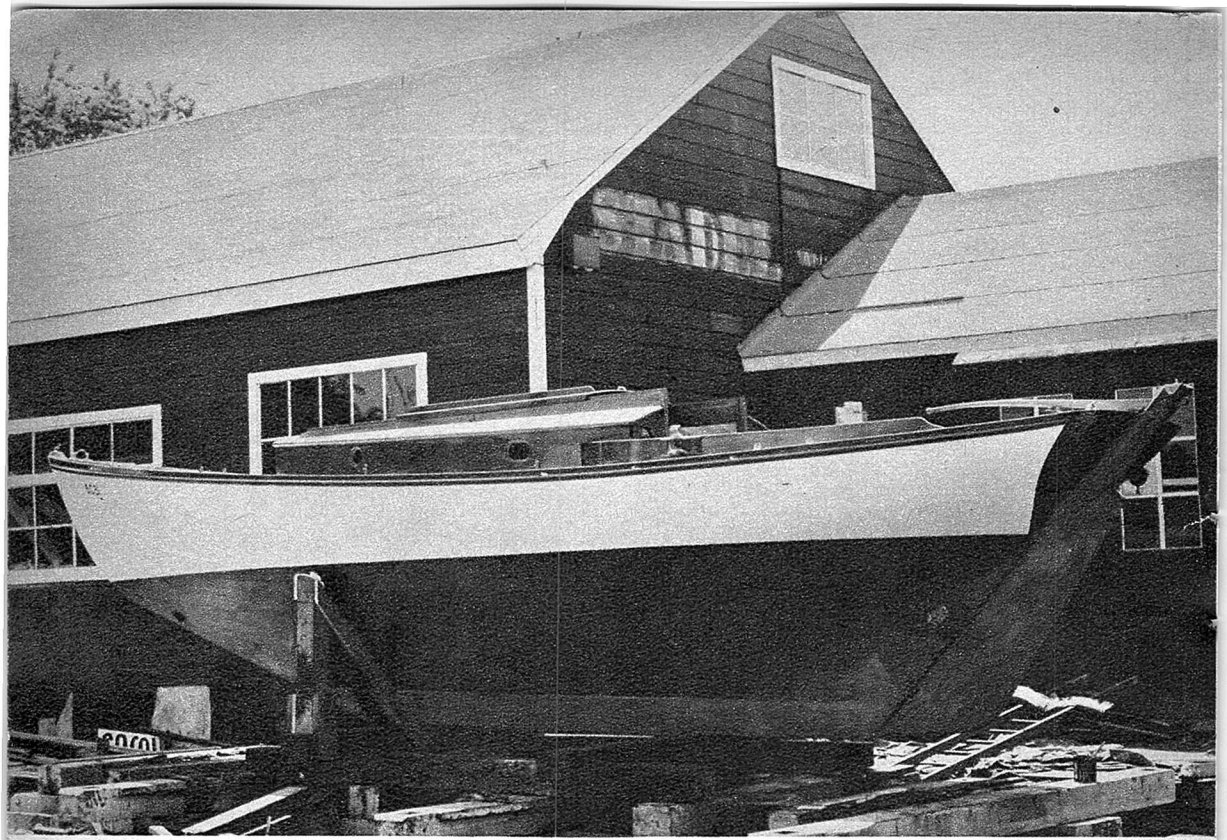
It is feared that most of the owners of H 28's will have to report to the office without fail on Monday morning and even telephone mother or Aunt Susie on Saturday night, and so had best have a motor. Now motors, like women, are not all bad, but it must be admitted there is a great difference in them. It would be far the best to have each owner choose his own engine, but for me the choice would be a small one with magneto ignition and impulse starter, as there would be no batteries and a very small amount of wiring. There are also some very good one-cylinder motors made today with counterbalanced crankshafts and light pistons and connecting rods so their vibration is very small. They are to be highly recommended on account of their great economy—(a one-cylinder engine has less cylinder surface for its piston displacement, and so less of the heat or power is wasted through the water jacket).

BEGINNING CONSTRUCTION

Well, first of all it is usual to lay the lines of the yacht down on the floor, full size, and if you want to do this the most satisfactory way in most cases is to get some building paper (enough to cover a space about twenty feet by eleven feet). The building paper is what is generally used on a house under clapboards or between flooring. It comes in colors of light

The incomplete hull (left), looking from the transom forward. The transom and keel have been installed, and the bottom planking has been started from the keel up. The best paints to use on the completed hull (right) are those that are penetrating and seal the wood against the damaging effects of water.





The H 28 ready for launching. The remaining work can be completed while the boat is in the water.

green and brownish pink. Get a grade which has a surface hard enough to draw on. Of course, if your floor is smooth enough to draw on, the paper will be unnecessary, but the floor will have to be either painted black to be drawn on with soapstone chalk, or painted white if you are to use a lead pencil, so that the paper is often the best in the end, for it can be rolled up for future use if the yacht is set up on the floor where the lines were laid down and so cannot be gotten at.

Before tacking down the strips of paper be sure the floor is swept well and the heads of protruding nails are driven down. On this design the load waterline is the base line and all elevations are given in distances above and below the same. After snapping the chalk line for the load waterline you can tack a batten along the line for temporary use of a large square for laying off the stations. It will probably be best for you to make up a light but stiff wooden square with one limb about six feet and the other about four feet because there will be many other uses for this square as the work goes on.

Of course, I cannot here give full instructions for laying down a yacht, but be sure you have many battens, some very stiff for such lines as the sheer and some very light and flexible for the sections. Many yachts which I have designed were built without being laid down, as the builders had confidence in the table of offsets and simply laid off the sections for making the molds, keel, etc., full size. I would recommend this if you are familiar with every step of what you are doing. For most people, however, it is safer to lay the whole of the lines down full size.

THE LEAD KEEL

Lead is a wonderful material to make a keel from for it gets along well with the bronze keel bolts. It is ductile enough to absorb shocks when running aground. It can be melted at low temperature and is heavy. It also can be planed with a carpenter's plane. But I advise you to have your local foundry cast the keel for you, or you may find yourself in the same predicament that Cellini was in when he was casting the statue of Perseus, and have to tear down your neighbors' houses and fences to keep the pot boiling at the last minute.

The lead on H 28 is purposely shaped so

it will be easy to make a pattern, or a wooden mold to flow it into. In the latter case flat boards about one inch thick can form the sides, but the frame outside must be very strong, for the melted lead will press down and outward about 700 pounds for each square foot. So, besides strong cross pieces above and below the mold, it is well to have a few iron rods passing right through where the lead will be to hold the two sides from spreading. These rods, if heavily painted with graphite paint, will drive out easily when the mold is removed.

The mold should be backed up with tightly tamped earth on the outside to help support it between braces and to prevent the lead's running far if a leak is started when the side boards shrink or crack under the heat of casting. If the lead is cast for you by a professional foundryman he will mold it right in the earth (probably dig a hole in his foundry floor) so he will require a pattern to cast from just the same as if it were to be of iron. And, by the way, for those who prefer an iron keel, it can be made the same size and shape as the lead one and the difference in weight simply make up by inside ballast. At any rate. in casting the lead keel be sure that at least one per cent of antimony is added to it, for this stiffens up the lead enough so that it drills well and even planes better. On this design the keel bolts are tapped into the top of the lead and it is almost impossible to tap pure lead, for it balls up the tap so that a clear thread is unlikely. When antimony is added to the lead, or junk lead used which has some tin, solder or pewter in it, it seems to tap O.K. Be sure to drill a hole larger than is called for when tapping bronze or iron, because some of the lead will squeeze out and make a full thread, and remember that, as these bolts go into the lead about six times their diameter, a perfect thread will not be necessary. In drilling and tapping, use kerosene for lubricant; in screwing down the bolts use heavy oil.

SETTING UP

There are many different methods of setting up the framing of a yacht and they all have their advantages and disadvantages, but it is likely that most amateurs would prefer to build her right side up and bend the frames inside ribbons or battens bent over the molds. This is the commonest way in most places. A perfectly good job can be done on a yacht of this size and shape by simply planking her up over the molds and, as each mold is removed one by one, frames are steam bent over the mold to approximate shape and fastened in place by fastenings in the same holes that held the planks on the molds. Be sure to keep battens or temporary deck beams across the yacht so she will not spread at the deck line when the molds are removed. This is the simplest and cheapest method I know of and perfectly satisfactory. It is the method that was used by the late John Harvey, who for many years had charge of the small boat building department of the George Lawley Sons Corporation.

No matter what system is used for setting up or bending the frames, it is well to have the floor timbers bolted in place on the keel first so they can have their outer faces correctly lined up and beveled to receive the planks, for much of the strength of the yacht will depend on a good wood fit between the planking and the floor timbers. The first few frames at the bow can be sawed frames as they are so straight that the grain can run a long distance on them and so they will be as strong as steam bent frames and they can be beveled so their lower ends will fit on the floor timbers and the upper end on the clamp. This is not so with the usual bent frames near the ends of a yacht where the planking is not very parallel with the center line.

The clamp of H 28 is made in two pieces as is done on larger yachts and sometimes referred to as a shelf and clamp. It is done on this design as it is thought to be much easier for the amateur to bend in two light pieces than one stiff, square one and, as this boat has such a long cockpit and cabin house, the deck beams need the additional support this arrangement gives.

MATERIALS

There are a great many varieties of oak and most of them are very poor indeed, for they soon rot. The true white oak is one of the best. He (for the white oak is very masculine) is not called white oak because the wood is white or light color, but because as you walk through the woods his bark has quite a light shade in contrast with the rest of the forest, and when the breeze lifts or turns the leaves, their under side is quite light. The wood itself is a brownish green color and I cannot describe it better than to say it resembles laminations of cat gut and horn in thin, alternate layers, and it acts like it. You will practically have to use white oak for the frames and, if you can, use it for the stem, keel, floor timbers and stern post; it would also be good for the deck beams

TABLE OF OFFSETS FOR H 28

MEASUREMENTS GIVEN IN FEET, INCHES, AND EIGHTHS OF INCHES

	ELEVATIONS ABOVE AND BELOW L.W.L.							HALF BREADTHS										DIAGONALS		
STATION NUMBERS	TOP-DECK AT SIDE	BUTTOCK 3'	BUTTOCK 2'	BUTTOCK 1'	RABBET	TOP OF LEAD	PROFILE	AT DECK	W.L.+3'	W.L.+2'	W.L.+1'	L.W.L.	W.L.-1'	W.L.-2'	RABBET	TOP OF LEAD	FACE	NO.1	NO.2	STATION NUMBERS
0	3-6-0				3-8-2		3-6-0	0-1-0							0-1-6		0-1-0			0
2	3-2-5			2-6-0	0-9-0		0-5-6	1-4-3	1-3-0	0-9-2	0-3-3				0-1-6		0-0-4		0-8-4	2
4	2-11-4		2-2-6	0-6-7	-0-5-3		-0-6-3	2-4-4		1-10-4	1-3-4	0-6-6			0-1-6		0-0-4	0-5-0	1-7-4	4
6	2-8-6	2-5-6	0-6-7	-0-6-1	-1-3-1		-1-4-2	3-1-2		2-9-5	2-3-2	1-6-1	0-5-3		0-1-6		0-0-5	1-0-6	2-5-3	6
8	2-6-2	0-10-0	-0-4-6	-1-2-7	-2-0-5	-2-2-2	-2-2-1	3-7-5		3-5-7	3-1-1	2-4-7	1-3-3	0-2-2	0-1-6	0-0-6	0-0-6	1-7-1	3-1-7	8
10	2-4-0	-0-0-6	-0-11-7	-1-8-2	2-2-4	2-3-1	-3-0-0	3-11-7		3-11-3	3-7-7	3-0-6	1-11-1	0-7-4	0-4-3	0-3-6	0-1-0	1-11-5	3-7-7	10
12	2-2-1	-0-6-4	-1-3-7	-1-11-2	2-3-4	2-4-0	-3-1-0	4-2-5		4-2-4	4-0-1	3-6-1	2-5-4	0-10-7	0-6-0	0-5-1	0-2-7	2-2-6	4-0-1	12
14	2-0-1	-0-9-1	-1-4-7	-2-0-0	2-4-4	2-5-0	-3-2-0	4-4-0		4-4-0	4-2-2	3-9-2	2-8-1	0-11-6	0-5-7	0-5-1	0-3-1	2-3-4	4-2-4	14
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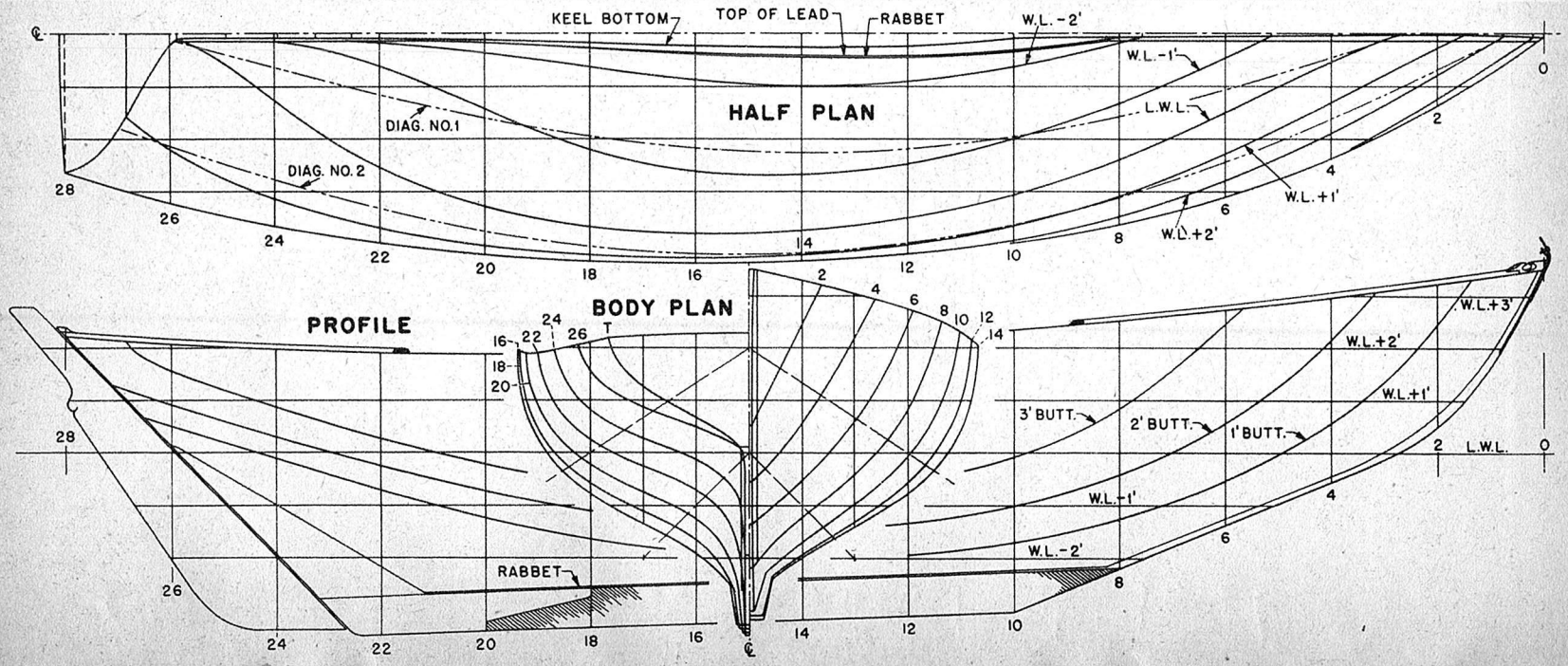
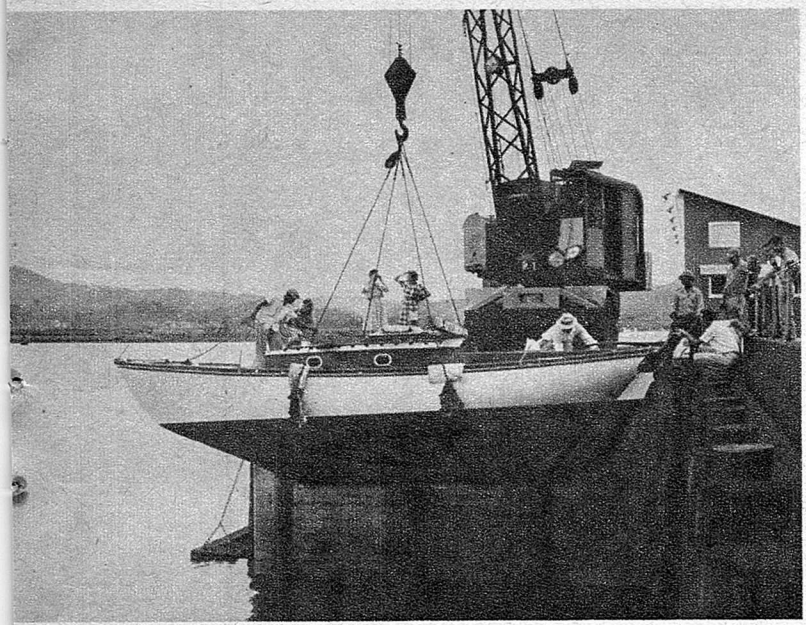
18	1-10-7	-0-6-7	-1-1-1	-1-7-5	2-6-3	2-6-7	-3-3-7	4-4-0			4-2-4	3-8-0	2-2-4	0-7-5	0-3-5	0-3-3	0-2-2	1-11-5	4-0-7	18
20	1-10-4	-0-2-6	-0-8-7	-1-3-0	2-7-3	2-7-7	-3-4-6	4-2-6			4-0-5	3-3-5	1-5-0	0-4-5	0-2-3	0-2-2	0-1-4	1-7-4	3-9-4	20
22	1-10-7	+0-3-0	-0-3-0	-0-8-4	2-2-4	2-8-7	-3-5-6	4-4-0			3-8-4	2-6-5	1-7-2	0-2-0	0-1-6	0-1-2	0-1-2	1-1-7	3-4-2	22
24	1-11-5	0-10-2	+0-3-3	-0-1-2	-1-0-1		-1-11-3 -3-4-4	3-8-1			3-2-0	1-3-1	0-1-7		0-1-6		0-1-0	0-8-0	2-9-6	24
26	2-0-6	1-6-6	+0-10-7	+0-6-0	+0-1-4		+0-1-5 -2-0-4	3-2-5		3-2-3	2-3-0				0-1-6		0-2-6		2-1-6	26
28	2-2-3		+1-7-2	+1-1-5			+2-2-3+1-5-2	2-8-0												28
TRANSOM			+1-3-2	+0-8-0				2-8-0		2-7-1	1-6-7	0-1-2	0-1-0	0-1-0			0-2-6	0-1-6	1-10-0	TRANSOM





The modern marina is equipped to launch a boat as large as H 28 easily. The derrick will gently lower the boat into the water without the slightest risk of damage.

and transom, but here yellow bark oak will do.

The so-called hurricane pine—that is, our native soft pine—is a little different from the regular large forest white pine named *Pinus Strombus,* but as no two botanists agree as to the exact number of varieties in any region we shall have to go by local names. The hurricane pine around here (Massachusetts) is the variety the old-fashioned cabinetmakers and boat builders called punkin' pine. It is of a pinkish, yellow color and one of the nicest woods to work. It does not swell or shrink much, or rot easily, but do not confuse it with some of the western and California pines which rot very quickly. If you can get some of this hurricane pine, even if it has some knots in it, it will make most excellent decking, very good planking, and the very best interior trim.

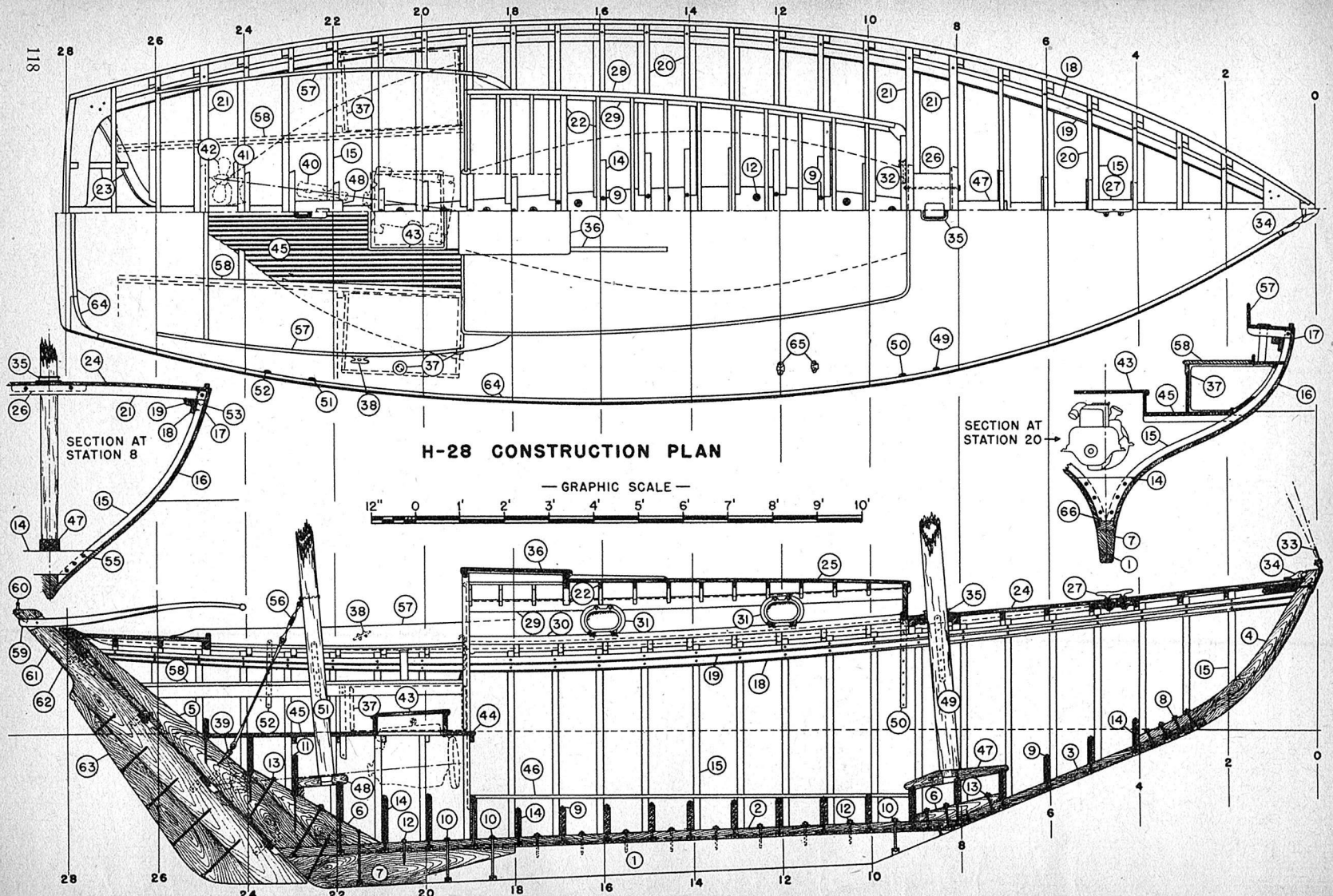
For planking, if you use fir which is called for on the construction plan (because it is the cheapest satisfactory wood for the purpose), be sure that it is all rift-grain and of fine texture and has been kiln dried down to the same moisture content that commercial flooring is. Of course, there are a number of very good woods for planking, but in most cases they are expensive.

As for the metals, you will do well if you stick to Tobin bronze for everything, except the screws which we will speak of later. Tobin bronze is like white oak—it will bend without breaking and last indefinitely. It also is a pleasure to work. Most all boat builders today agree that Everdur screws are the cheapest in the end, for so few of them break in driving even if the hole is not exactly the right size; and, of course, Monel screws are very fine, also. But no matter what sort of screws you use, do not rub them on soap, as so many writers advise, but use a heavy grease to lubricate them. Soaps nearly all have strong chemicals in them which shorten the life of the screws while the grease preserves them.

The canvas for the deck and deckhouse is another material on which many builders go wrong. The proper thing to use is loosely woven light cotton sheeting, and if this material is set on a deck well coated with white lead and oil paint, the paint will penetrate up through the sheeting and meet, or amalgamate, with the later coats of paint on top so that a solid, long wearing and watertight cover is made. Strange to say, this is the place where the cheapest material is the best and, besides, the cotton sheeting can be bought in very wide strips.

PAINTS

A whole lot could be said about paint, for on this subject in particular, there is a lot of misinformation. You hear some people say, "Save the surface and you


SECTION AT STATION 8
SECTION AT STATION 20
H-28 CONSTRUCTION PLAN
— GRAPHIC SCALE —
12" 0 1' 2' 3' 4' 5' 6' 7' 8' 9' 10'

save all," but this is far from the truth in boat construction. Many of the modern paints and lacquers are quick and easy to apply, but they do not penetrate. They make a hard shell on the surface so that at the seams, and particularly at fastenings, the water gets below the surface and causes the wood to swell and gives a chance for rot to start. No doubt you have noticed how the fastenings will stain and corrode under these hard surface lacquers. When a penetrating paint like linseed oil, lead and turpentine is used, the texture of the wood for some distance in is sealed or filled with a water repelling substance.

It is very easy to mix your own paints and you can vary them to meet your own needs by only using a little common sense. If you are bound to use the more modern paints with a cellulose base, or the varnishes used today, be sure to first put on a filler coat of a mixture the paint makers recommend and sell for this particular purpose, and that will, to a certain extent, seal or fill the wood underneath.

THE ENGINE INSTALLATION

The propeller is set off center for the six following good reasons:

1. The propeller shaft does not interfere with the normal keel bolts which are very important in this region.
2. The yacht is faster and more economical under power.
3. The yacht is faster under sail.
4. The yacht steers better under power.
5. The yacht steers better under sail.
6. If it is decided to remove the motor to make a straight sailer, or to set up a different shaft line for a different motor, the matter is much simplified with the off center screw.

As to Number 2. Actual experience has proven that the off center propeller increases the speed or economy from ten to twenty per cent over a centerline propeller. The reason for this is that as a vessel passes through the water she gathers up a swirl of eddies caused by skin resistance, and under the stern at the centerline considerable water is following along with the vessel. Now if you place your propeller in this wake and upset its natural eddies which are decreasing surface resistance, and put in its place a propeller slip stream going thirty per cent faster than vessel, then you'll probably increase the total resistance some fifteen per cent.

THE ENGINE BED

I should prefer to have the engine bed made of angle iron or pipe properly folded, forged or welded at the engine lugs, etc. The ordinary wooden engine logs prevent one from reaching around and wiping off the crankcase and are a fire menace, as they are often saturated with oil and gas. On H 28 the after, outer engine lug or support comes right out to the planking, so that a properly shaped block at this point will hold the engine from fore and aft and sidewise motion, if there is a diagonal brace to one of the other supports, so that the other supports can be run directly to a floor timber. With a little ingenuity a quite simple metal engine bed can be made and sometimes it is advisable to do away entirely with the shoe the engine maker has furnished for a wooden log.

OTHER METAL FITTINGS

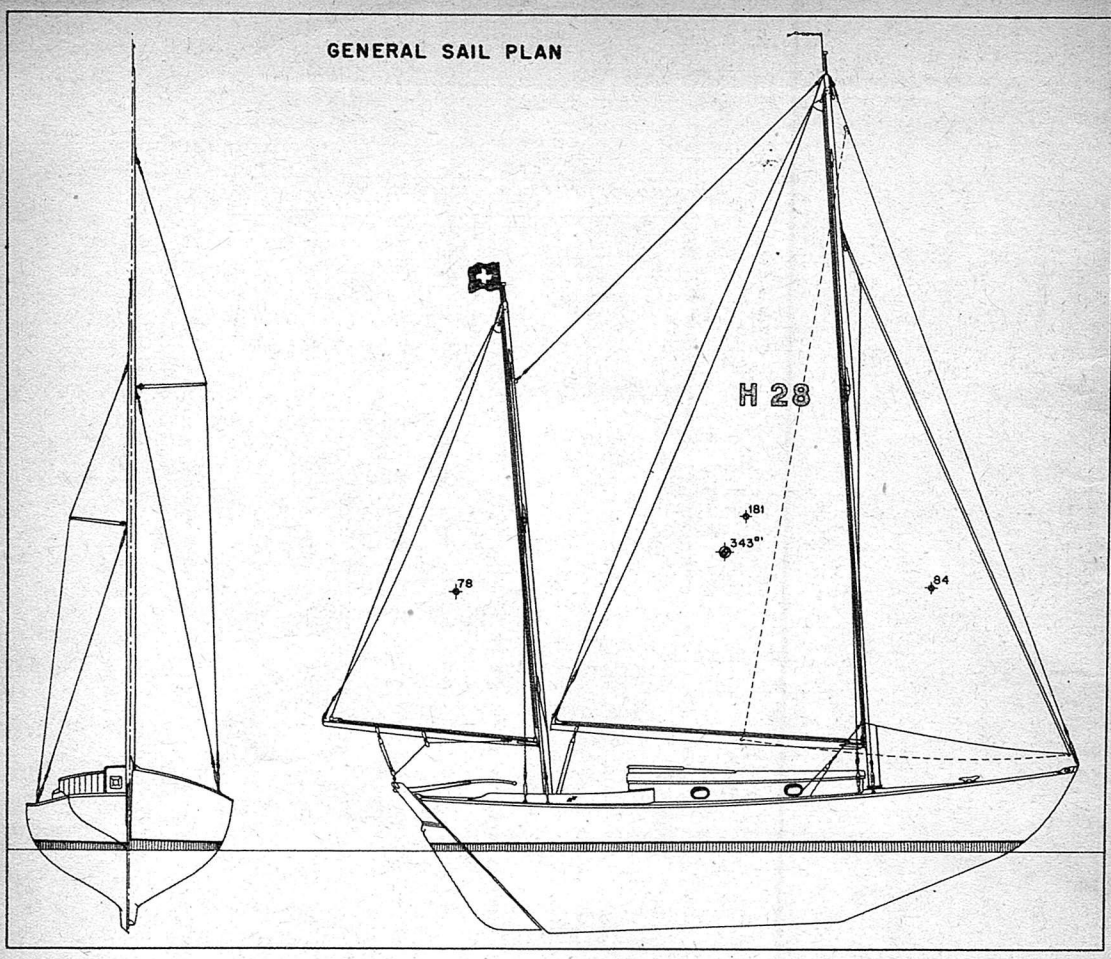
Throughout the design I have tried to use stock fittings, but in the case of the rudder pintles and gudgeons I am unable to find a suitable pattern, so I have designed these and the spar fittings, and they will only require three quite simple patterns and little machine work.

THE SPARS

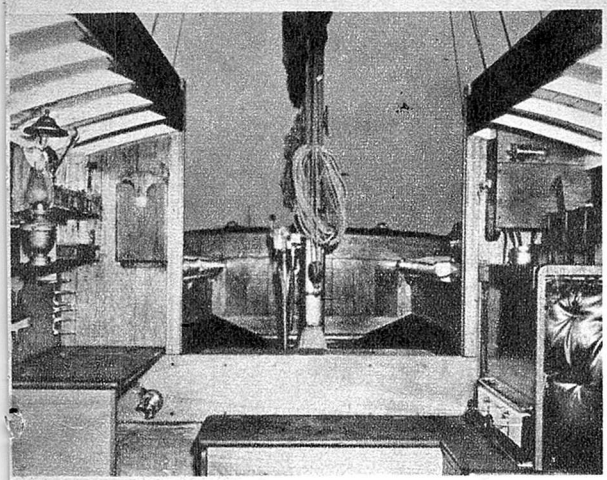
All the spars are of rectangular section and so are about as easy to make as a long box. Their flat sides make the attachment of the shrouds more efficient. These are the reasons why I invented the rectangular spar construction some twenty years ago, and their use is now quite universal. On H 28 the forward and after staves of the masts and upper and lower staves of the boom have a slight rabbet cut in them which you can easily do with a rabbet plane by tacking a batten along to guide the plane. This is done to hold the side pieces in place when gluing up. The principal trick in making this sort of spar is to hold them straight and stop them from twisting when gluing up, and this can often be done along the side of a building by nailing pieces of wood out at right angles to the studding so the building and the strips hold the staves straight in two directions and leave room for clamping between.

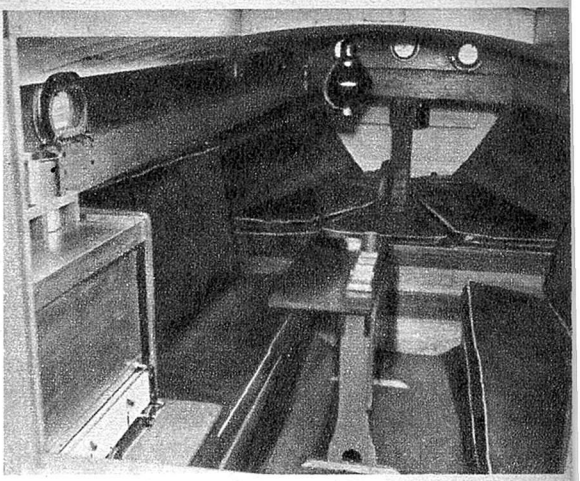
SPECIFICATIONS FOR CONSTRUCTION PLAN

1. Lead keel, 2,800 lbs.
2. Main keel, oak, 2½″x13″x16′.
3. Fore keel, oak, 2½″x4½″x6′.
4. Stem, white oak natural crook, 4½″x6′.
5. Stern post, oak, 4½″ by 9″x7′ 3″.
6. Knees, oak, 4½″ athwartships.
7. Deadwood, hard pine, 7″x9″x5′ 3″.
8. Scarf bolts, ⅜″ Tobin, nut and washer both ends.



9. Floor bolts, all $\frac{7}{16}$″ Tobin, nut and washer both ends, two on floors 10 to 17.
10. Lead through bolts, ½″ Tobin.
11. Drive bolts, ⅜″ galv. iron or Tobin (self heading or clinch ring).
12. Hanger bolts for attaching lead, ⅝″ Tobin, U.S.S. thread, let into the lead 3″ or more, staggered. See deck plan.
13. All other bolts through keel, $\frac{7}{16}$″ Tobin.
14. All floor timbers, oak, 1½″ thick. Take depth from plan.
15. All frames, white oak, 1⅝″x1⅝″. Those on station 6 and forward can be sawn and beveled, the others steam bent. The frames, floors and deck beams change at 15 where the midship section, or dead flat mark, is.
16. Planking. Rift grain fir, 1″ thick. If cedar or soft pine, 1⅛″ thick. If mahogany or yellow pine, ⅞″ thick. The plank above the W.L. should not be more than 4″ wide, with the exception of sheer strake.
17. The sheer strake should be of fairly hard wood to take the shelf bolts; hard, fine grain fir, oak or yellow pine will do, 5″ or more wide amidships.
18. Clamp, fir, spruce or hard pine, 1″x3½″.
19. Shelf, fir, spruce or hard pine, 2″x2″.
20. Regular deck beams, 1⅜″x2″, crown 3¾″ in 10′.
21. Strong beams, three, 2″x2″, crown 3¾″ in 10′.
22. House beams, ¾″x1½″, spaced 9″, and one at hatch 1½″x1½″, crown 6″ in 6′, or a radius of 8′ 3″. All beams can be white oak, ash, elm or yellow-bark oak, or even red oak, for they are larger than usual.
23. The transom can be planked up of 1″ thick oak over the stern post, frames and aprons as shown. Planks about 6″ wide fastened and caulked same as planking.
24. Main deck, ¾″ or more, tongue-and-groove pine 3″ or less wide, canvas covered.
25. House deck, ⅝″ or more, tongue-and-

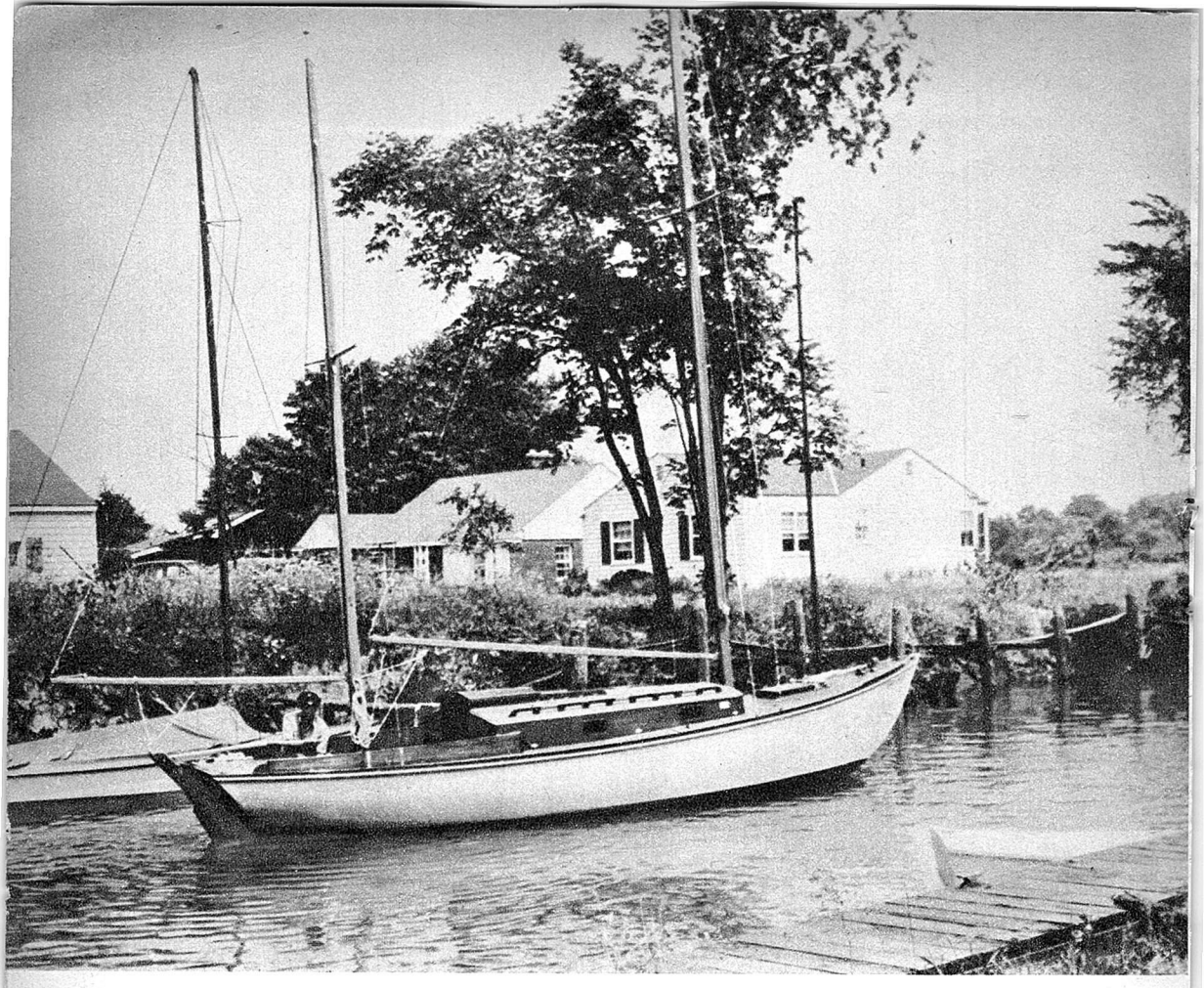




The cabin of H 28. Careful planning has produced a surprisingly roomy home aboard ship. The galley (left) reveals a compactly installed stove and work table with room enough for the cook to move about. Beyond the stove (right) is a comfortable dining area with benches that convert into bunks for four.

groove pine, 2½″ or less wide, canvas covered.

26. Mast partner, oak, 1½″x10″x20″, with ⅜″ through bolts.
27. Mooring cleat, Wilcox, Crittenden Fig. 4020 or similar. 10″ long on oak block, 1″x6″x10″.
28. House sides and forward end, soft pine, if painted 1¼″ thick; if varnished, mahogany, oak or teak 1″ thick.
29. Lodging piece for deck beams about 1″x3″, oak or mahogany.
30. Finish piece to cover the deck canvas where turned up—any wood to match interior trim.
31. Wilcox, Crittenden Fig. 5252, size 5″x9″ or 4″x7″ as owner desires.
32. Wilcox, Crittenden Fig. 523, size 4″, port and starboard.
33. Stem band in two parts for attaching both the forestay and the headstay. Inner piece $\frac{3}{16}$″x2″x27″; outer piece $\frac{3}{16}$″x2″x13″. Hard Tobin or Phosphor bronze $\frac{7}{16}$″ pin for thimble of forestay. The outer layer extends up to take the clevis of the headstay turnbuckle and has a $\frac{5}{16}$″ hole.
34. Cast bronze bow chocks.
35. Mast collar to take the mast coat, can be either cast bronze or shaped up of sheet copper. Mast is 4¼″x5½″ at deck.
36. Hatch and slide of hard wood, opening 20″x26″.
37. Gas and water tanks, alike of tin lined copper. The size shown will hold about 23 gallons and is shaped to fit the yacht on the outer sides. They have filler pipes and vents outside the coaming as shown to allow the gas to settle outboard when filling tank. If smaller capacity is sufficient, round or oval tanks can be used. It is recommended to have the water tank on the side the stove will be on (if the stove is near the cabin bulkhead), very firmly secured.
38. Jibsheet cleats, port and starboard, Wilcox, Crittenden Fig. 4020, 5½″.
39. Screw eye bolt for mizzen brace or backstay. Wilcox, Crittenden Fig. 2181, ½″x3¼″. See rigging list for other parts.
40. Special cast bronze inside stuffing box, depending on size of motor used.
41. Special one-legged strut of cast bronze bolted through stern post.
42. Hyde 2-blade, feathering propeller, 12″ diam.
43. Removable box cover over engine, top same as house deck, canvas covered.
44. Threshold is a removable board, ¾″x9″x21″, of hard wood to lift out when cranking motor.
45. The best cockpit floor would be of slats about 1″ wide, ¾″ thick spaced about ¼″, of teak, elm or oak, with removable section near the centerline.
46. The cabin floor can be tongue-and-groove soft pine from ⅝″ to ¾″ thick, painted or varnished.
47. Mast step, oak, 3½″x5″x2′ 5″, cut mortise for mast tongue way through to drain water. Tongue of mainmast is 4″x1¼″.
48. Mast step, oak, 2½″x6″x13½″, tongue of mizzen 3″x1″.



H 28, designed for the busy man who can only spend short periods of time on the water, can be put under sail quickly for a summer evening's cruise. Her construction is sound enough to buck white water.

49. Main upper shroud chainplates, $\frac{3}{16}$"x 1¼"x18".
50. Main lower shroud chainplates, $\frac{3}{16}$"x 1½"x24".
51. Mizzen upper shroud chainplates, $\frac{3}{16}$"x 1"x15".
52. Mizzen lower shroud chainplates, $\frac{3}{16}$"x 1¼"x18". All chainplates of hard rolled Tobin or Phosphor bronze and fastened through planking with ¼" stove bolts, spaced to clear seams of planking.
53. If the shelf and clamp are well through bolted, there will be no need of hanging or lodging knees to support the deck beams. On the drawing there is shown a $\frac{5}{16}$"x6" stove bolt which can be either galvanized iron, Everdur or brass. The clamp can be fastened with No. 14 wood screws of about 2½". The head of the frames and deck beams can be joined with ¼" bolts or slightly smaller copper rivets.

    The ends of the deck beams can be secured to the clamp with No. 16 3½" Everdur wood screws, and it would be well if the ones through the strong beams were larger.
54. Planking fastenings, No. 14 Everdur screws 2¼" long, into frames with a ½" bung.

    The fastenings through the garboard into the back rabbet of keel may have to be shorter. Be sure to fasten the planking to both the frames and the floor timbers as this relieves the strain on the bolts through the frames and floors No. 55.
55. These should be $\frac{5}{16}$" bronze bolts or copper rivets about ¼" diameter.

56. We are sorry to say the mizzen will need an after brace or stay, and this will be shown on the rigging plan. If preferred, the mizzen can be supported by a stout thwart between frames 22 and 23. The springstay from the mizzen to the mainmast head will hold the mizzen forward.
57. The cockpit coaming, from ¾″ to ⅞″ thick, depending on hardness of the wood; of mahogany, oak or teak, and would look nice if it matched the other deck trim, if varnished. The forward end is fitted to a shaped block to avoid the necessity of steaming.
58. The cockpit seats can be soft pine about 1″x19″x7′ 8″ with lighter sheathing back of them. The apron or skirt near the inboard edge must be quite strong unless there is more than one support as shown. The apron can be ⅞″x3″ if soft wood, and smaller if hard wood. Aft of the tanks there can be some athwartship cleats, if desired.
Very good seats can be made like the cockpit floor and slats let the rain or water through quickly. Also they prevent one from slipping sideways somewhat. But remember 19″ is about the minimum width to sleep on.
59. The tiller can be of ash, oak or locust, 2″ square at rudder head, about 1⅜″ and 1½″ at fluting, ⅞″ at the neck, with 1½″ ball.
60. Cast bronze bale for attaching mizzen sheet, about ½″ diameter where round.
61. Copper rivets through the rudder to secure the cheek pieces.
62. The forward plank on the rudder, or rudder stock, is 2″x9″x8′ 5″ and the cheek pieces ⅞″x5½″, 2′ 10″ and well beveled off forward to allow the rudder to swing 45° each side of centerline. Some kind of oak is the usual material for rudders of this size.
63. The after piece of rudder is 1½″x10½″x 6′ 1″ and secured with $\frac{5}{16}$″ self heading drive bolts of either galv. iron or bronze, the trailing edge of rudder about 1¼″ at W.L., ⅞″ at the widest part of the rudder.
64. Toe rail, quarter knees and taffrail, either the same material as coaming and house sides, or teak, mahogany, oak or yellow pine—about 1″ wide, ¾″ deep amidships, increasing at ends to about 1″x1″ taffrail as shown.
65. Jibsheet leads—Wilcox, Crittenden Fig. 5811, size No. 2.
66. Don't forget the limber holes. They should be cut in the floors before they are set in place, and cut in the heels of the frames before planking. Large, smooth limber holes are a great convenience and quite worth while making right in the first place, and quite difficult to enlarge later.
67. Rudder pintles. See detail. There is a way to fit an oak block in the cavity below the upper pintle and gudgeon so that the rudder cannot rise and unship. This block can be about 1¼″x2″x3″ and held in place by gravity as the cheek pieces of the rudder will hold it sideways, but it can be lifted out when the rudder is at 45° or more.

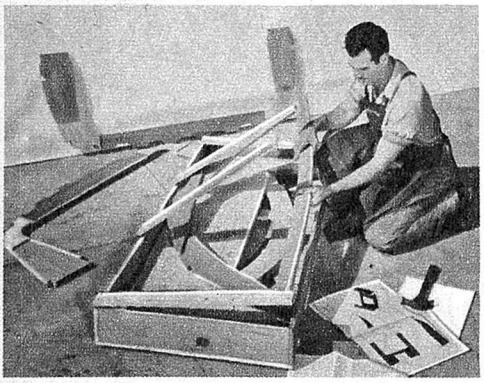
SPECIFICATIONS FOR CABIN PLAN

1. Oak stanchion, about 1¼″x1¼″x9″.
2. Transom seats, pine about ¾″ thick, or ½″ laminated wood.
3. Cross pieces, any wood about ⅞″x2″.
4. Upper face piece, ⅝″x3″.
5. Lower face piece, ⅝″x3″.
6. Combination tool box and step with hinged top. Outside of box about 18″ long, 8″ high, 11″ wide. After corners may have to be cut away for frame 19.
7. Removable threshold for cranking motor.
8. Removable section to raise cabin doors above motor cover. One end Wilcox, Crittenden Fig. 3600, other end two No. 14 screws with head sawed off. Ventilation holes, if wanted.
9. Cabin doors are best if paneled up so as to reduce shrinking and swelling. They can be about ¾″ thick. Cabin doors should be un-hung when sailing and can be stowed under the cockpit seats aft, if desired.
10. There are no commercial unhooking hinges that have the butts covered so thieves cannot unscrew the screws, so a full size drawing of proper ones is given. They must be made up in pairs, right and left hand with the pins of pintels of the lower hinges longest to facilitate hanging the doors. The pin is best if of $\frac{5}{16}$″ Tobin bronze either threaded or driven in, with well rounded upper end. (Maybe Wilcox, Crittenden will make some up.)
11. Wilcox, Crittenden Fig. 3600, brass.
12. Wilcox, Crittenden Fig. 475, polished brass.
13. Berth stop, oak ¾″x1½″x4½″.
14. Ratchet action clip to hold berth in folded position. Oak ¾″x1½′x about 7 or more inches. No. 14 round-head screw over washer.
15. Berth hooks of sheet brass or bronze from 1/6″ to ⅛″ thick.
16. Merriman Fig. 431—No. 2.

17. Food locker doors, flush for back rest when cooking, pine about ¾″x9″x18″.
18. Wilcox, Crittenden Fig. 358.
19. Wilcox, Crittenden stove Fig. 825.
20. Suggested position of Wilcox, Crittenden lamp Fig. 99—No. 1.
21. Curtain, if wanted, can be tied back against shelf and clamp at frame No. 10, or privacy can be had by putting on the cabin doors.
22. Wooden bucket with wide rim removable top—both to be hung normally under after deck.
23. Suggested position of Chelsea clock, marine 4½″ dial, and set hand.

Granted that H 28 is a large job, the man who builds it will find himself the proud owner of a boat load of pleasure. •

BOAT PLANS
PATTERNS . . . FRAME KITS



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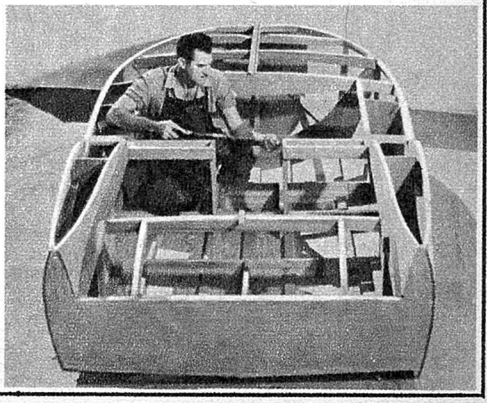
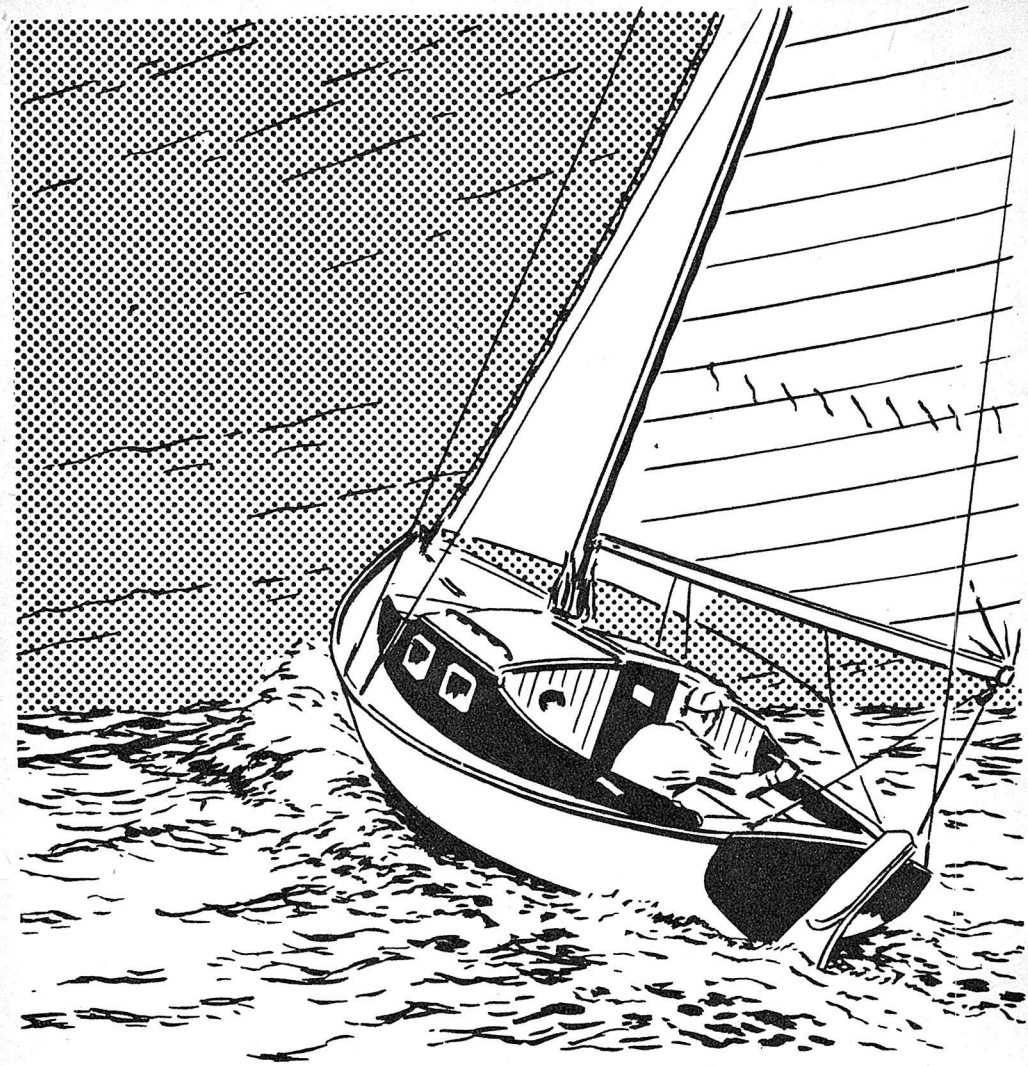




OSTKUST

by A. Mason

She's 24 feet from stem to stern, large enough for limited cruises and roomy enough for day sailing.

OSTKUST was designed to be an ideal day sailer, with a large cockpit that is almost 6 ft. 6 in. long, but yet has a comfortable snug cabin that would be perfect for two people for short cruises or for much longer cruises for two young people who don't mind roughing it a bit. However, as most of the sailing time is in reality day sailing where ease of handling is desirable, greater emphasis has been placed on designing a roomy cockpit so that a few congenial souls can find ample room for their

utmost comfort while enjoying the sunshine and air of a day on the water.

In contrast to most so-called day sailers, provision has been made for the installation of one of the many small inboard air or water-cooled engines. The one shown on the plans is a Lauson 2½ horsepower water-cooled engine with magneto ignition, which is ample to get the Ostkust into port after the wind has fallen to a flat calm at night or when it is necessary to make a train.

No companionway slide is indicated as this was deemed unnecessary. However if desired it would not be too troublesome to fit one, making the opening the same width as the companionway door openings and extending to the beam on about frame 21½. This would mean relocating the 5-in. cleat now shown on the centerline, but it would be a simple job. While not shown elsewhere except on the deck plan, the bulkhead forming the clothes locker on frame 24 is to extend to the cabin top or deck as necessary. Except to mention that no attempt has been made to indicate any of the shelves that would be desirable or required, there is very little more need be said about the cabin joiner work. However it is suggested that a single shelf port and starboard over the berths near the clamp be added with a lip of at least 2 in. height and 5 in. width to hold personal equipment. Forward opposite the hatch two shelves on each side should be fitted to stow ship's gear, etc., and these should be arranged to take the various items that normally would be stowed in this portion, as sail repair kit, tool box, lights, etc.

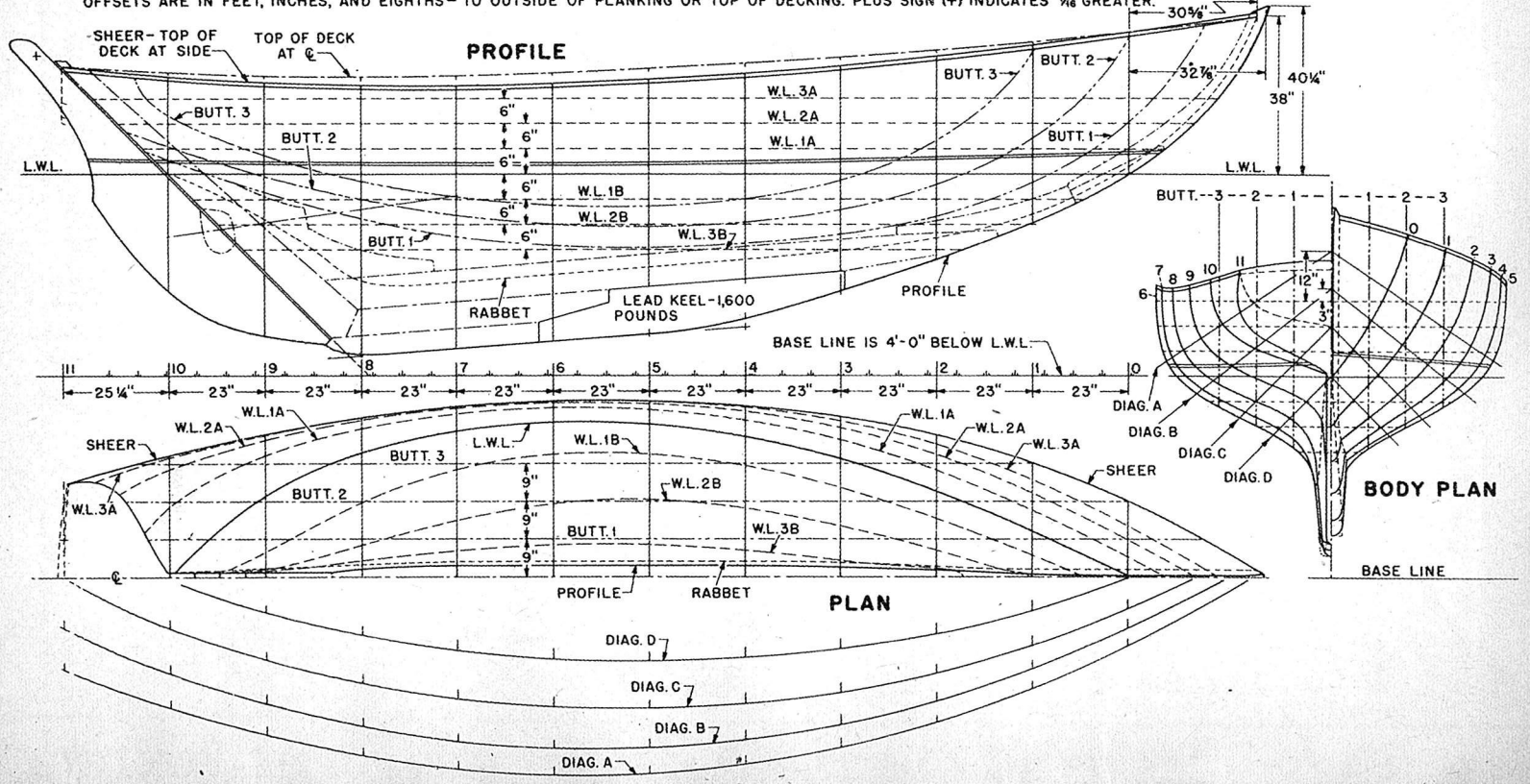
Also an extremely desirable and successful arrangement for a small boat is to provide various hooks for hanging duffel bags, sailbags, etc., and to keep various items in order and convenient when required. In fact the essence of a successfully arranged small boat is to have all the gear stowed in positions where it will be instantly available when required, and a place for everything that does not mean moving twenty different objects to find the desired item. An orderly ship is a happy ship!

As to the rig of Ostkust, this was designed to be efficient yet simple. As can be seen there are no shrouds above the jibstay as there is very little load on the mast above this point which the jumper struts cannot take care of. This arrangement of

— TABLE OF OFFSETS —

	HALF BREADTHS FROM THE CENTER LINE										HEIGHTHS ABOVE BASE LINE						DIAGONALS				
STA.	SHEER	W.L.3A	W.L.2A	W.L.1A	L.W.L.	W.L.1B	W.L.2B	W.L.3B	RABBET	PROFILE	SHEER	BUTT.3	BUTT.2	BUTT.1	RABBET	PROFILE	DIAG. A	DIAG. B	DIAG. C	DIAG. D	STA.
0	1-6-1	1-0-1	0-8-7	0-4-6	0-0-2				0-1-7	0-0-2	6-9-1		6-8-4	5-0-3	4-2-0	4-0-0	1-4-3	1-0-2	0-7-4		0
1	2-3-2	1-11-3	1-8-1	1-3-7	0-10-7	0-5-1			0-1-7	0-0-6	6-6-0	6-4-1	4-8-6+	3-9-7+	3-2-5	3-0-4	2-2-4	1-9-6	1-4-1	0-7-7	1
2	2-9-7	2-7-6	2-5-2	2-1-4	1-8-4	1-1-7	0-6-2	0-1-7+	0-2-4	0-1-5	6-3-3	4-8-0	3-9-4	3-2-1	2-9-0	2-3-5	2-10-4	2-5-3	1-10-7	1-1-4	2
3	3-2-2	3-1-2	2-11-4	2-8-6	2-4-2	1-9-2	1-0-1	0-3-7	0-3-3	0-2-3	6-1-1	3-10-5	3-3-5	2-9-6	2-5-5	1-8-1	3-4-3+	3-11-1	2-3-3	1-5-1	3
4	3-4-6	3-4-3+	3-3-3+	3-1-3	2-9-4	2-2-5	1-4-3	0-6-3	0-3-5	0-2-6	5-11-2	3-6-2	3-0-5	2-7-5+	2-3-7	1-1-4	3-8-4	3-2-6	2-6-1	1-7-1	4
5	3-6-0	3-6-0	3-5-3	3-3-6	3-0-4	2-5-3	1-6-3	0-7-7	0-3-6	0-2-6	5-9-6	3-4-5	2-11-6	2-6-6	STRAIGHT	0-9-7	3-10-7	3-4-5	2-7-2	1-8-0	5
6	3-6-0	3-6-0	3-5-5	3-4-3	3-1-0	2-5-2	1-5-4	0-7-7	0-3-6	0-2-6	5-8-7	3-4-6	3-0-2	2-7-0		0-8-1	3-11-3	3-4-7	2-6-7+	1-7-5	6
7	3-4-5	3-4-5	3-4-2	3-2-6	2-10-7	2-1-7	1-1-4	0-6-2	0-3-6	0-2-6	5-8-2	3-6-5	3-2-2	2-9-0+	1-10-3	0-6-3	3-9-6	3-3-1	2-5-1	1-5-5	7
8	3-2-0	3-2-0	3-1-3	2-11-2	2-5-6	1-5-7	0-7-3	0-4-0	0-3-0	0-1-5	5-8-2	3-10-2	3-6-0	3-1-4	1-10-5	0-5-1	3-6-5	2-11-7	2-1-3	1-1-7	8
9	2-10-0	2-8-7	2-8-5	2-4-7	1-7-2	0-6-0			0-1-7	0-1-0	5-8-7	4-4-3	3-11-4	3-7-6	3-10-3	0-9-4	3-1-4	2-6-2+	1-7-7	0-8-3	9
10	2-5-0	2-4-4	2-1-6	1-4-5	0-1-0				0-1-0	0-1-0	5-10-3	5-2-0	4-6-4+	4-3-3	4-0-4	1-8-1	2-7-3	1-11-2	1-0-2		10
T	1-10-3	1-10-5	1-7-7	0-10-3							6-0-6		4-10-1	4-5-3	4-1-0		2-2-2	1-7-7	0-10-4		T
11	1-10-1	1-6-6									6-0-6		5-5-2	5-1-3	5-0-2	5-0-2	2-10-1	1-0-0			11

OFFSETS ARE IN FEET, INCHES, AND EIGHTHS — TO OUTSIDE OF PLANKING OR TOP OF DECKING. PLUS SIGN (+) INDICATES 1/16" GREATER.



standing rigging has been used with considerable success on many sailboats of equal sail area, and while often a bit more troublesome to adjust to keep a straight mast, it has proved to be reliable. With the wide beam and the resulting wide spread to the shrouds the loads will not be as great as on the narrower rig. However one slight disadvantage for a wide spread of rigging is that it will not permit sheeting the Genoa jib when hard on the wind as might be desired, but in a wide short boat as Ostkust in a short choppy head sea it is impossible to sail as hard on the wind as in the narrower types. Hence the shrouds act as a check as to exactly how close one can really sail while on the wind. However when the breeze is light or off the wind in stronger breezes, the Genoa would be desirable, but when on the wind in a short choppy sea the working jib sheeted inside the shrouds would be much more suitable.

Speaking of the sails, mention should be made of the spinnaker; while it has been designed to the 1940 C.C.A. rule, this sail would not be too large for cruising when sailing off the wind, yet would be large enough to make things interesting while racing. Incidentally, rather than using a swivel halliard block, which always seems to jam or cause trouble, a lignum vitae lizard is used, simple and efficient.

One thing should be mentioned at this point and that is the purpose of the various cleats not indicated otherwise, as follows:

Six-inch cleats P. and S. off end of the cabin are for main and jib halliards.

Five-inch cleat on centerline of cabin top is for the boom downhaul.

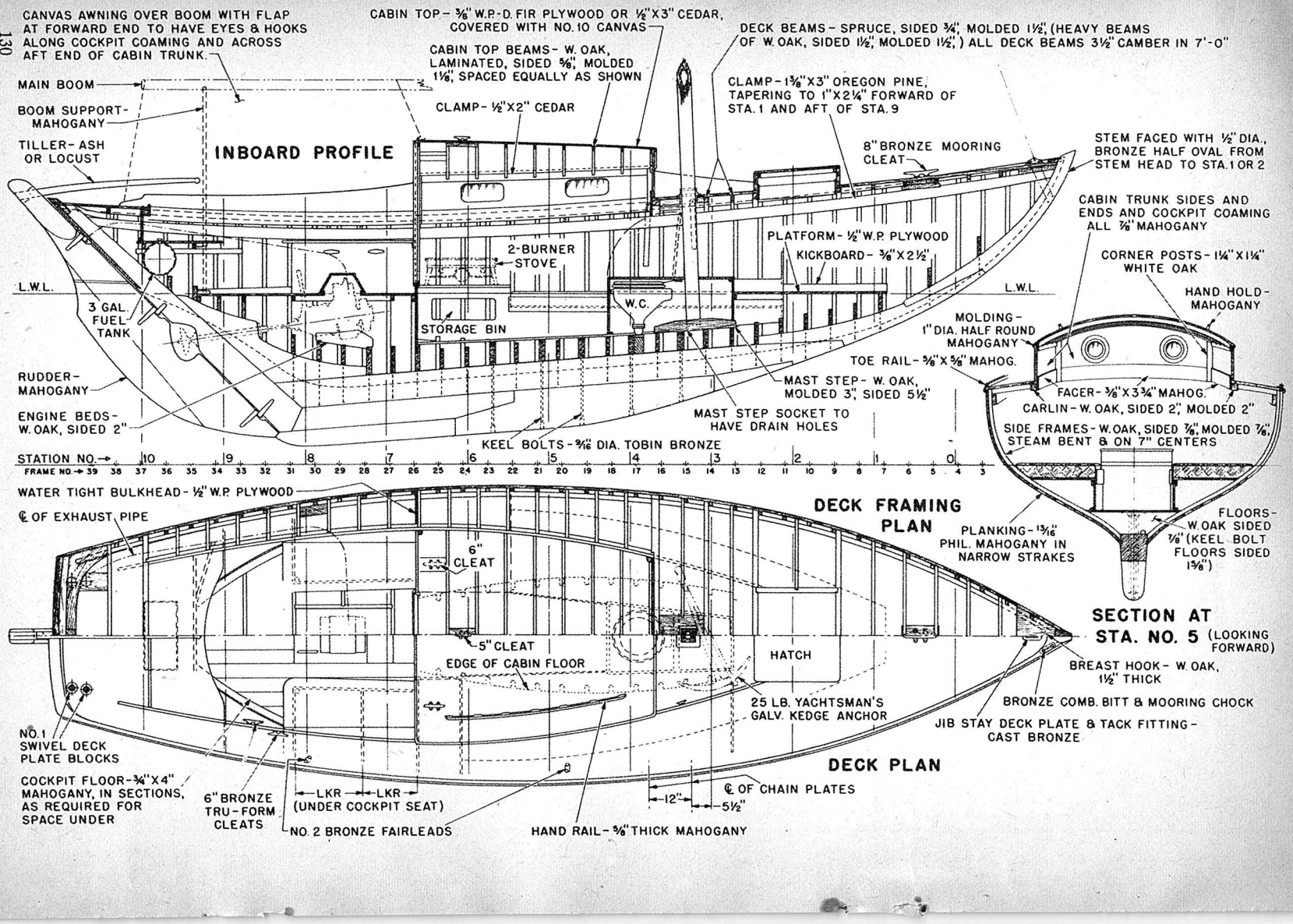
Six-inch cleats on the inside of the cockpit coaming port and starboard, frame 33, are for the double ended mainsheet.

Six-inch cleats on the outside of the cockpit coaming P. and S., frame 32, are for the jib-sheets.

Five-inch cleats P. and S. on the mast are for the double ended spinnaker halliard.

Incidentally no provisions should be made for the boom lift outside of a lanyard for initial adjustment. The length of the boom lift should be such that when the sail is lowered and the boom is not in the boom crotch, the boom does not come down and "bosh in" some guest's head. What other times a need for an adjustable boom lift exists are so rare as to make it impractical to carry the extra gear in the form of blocks, tackles and cleat.

Speaking of the boom, this is to be solid while the mast is hollow, and this was done so that the heavy boom would keep the


CANVAS AWNING OVER BOOM WITH FLAP AT FORWARD END TO HAVE EYES & HOOKS ALONG COCKPIT COAMING AND ACROSS AFT END OF CABIN TRUNK.
CABIN TOP – 3/8" W.P.-D. FIR PLYWOOD OR 1/2"X3" CEDAR, COVERED WITH NO.10 CANVAS
DECK BEAMS – SPRUCE, SIDED 3/4", MOLDED 1 1/2", (HEAVY BEAMS OF W. OAK, SIDED 1 1/2", MOLDED 1 1/2") ALL DECK BEAMS 3 1/2" CAMBER IN 7'-0"
CABIN TOP BEAMS – W. OAK, LAMINATED, SIDED 5/8", MOLDED 1 1/8", SPACED EQUALLY AS SHOWN
CLAMP – 1 3/8"X3" OREGON PINE, TAPERING TO 1"X2 1/4" FORWARD OF STA. 1 AND AFT OF STA. 9
MAIN BOOM
BOOM SUPPORT – MAHOGANY
CLAMP – 1/2"X2" CEDAR
TILLER – ASH OR LOCUST
INBOARD PROFILE
8" BRONZE MOORING CLEAT
STEM FACED WITH 1/2" DIA., BRONZE HALF OVAL FROM STEM HEAD TO STA. 1 OR 2
CABIN TRUNK SIDES AND ENDS AND COCKPIT COAMING ALL 7/8" MAHOGANY
PLATFORM – 1/2" W.P. PLYWOOD
KICKBOARD – 3/8"X2 1/2"
2-BURNER STOVE
CORNER POSTS – 1 1/4" X 1 1/4" WHITE OAK
L.W.L.
3 GAL. FUEL TANK
W.C.
STORAGE BIN
L.W.L.
HAND HOLD – MAHOGANY
MOLDING – 1" DIA. HALF ROUND MAHOGANY
TOE RAIL – 3/8"X 5/8" MAHOG.
RUDDER – MAHOGANY
MAST STEP – W. OAK, MOLDED 3", SIDED 5 1/2"
FACER – 3/8"X 3 3/4" MAHOG.
CARLIN – W. OAK, SIDED 2", MOLDED 2"
ENGINE BEDS – W. OAK, SIDED 2"
MAST STEP SOCKET TO HAVE DRAIN HOLES
SIDE FRAMES – W. OAK, SIDED 7/8", MOLDED 7/8", STEAM BENT & ON 7" CENTERS
KEEL BOLTS – 9/16" DIA. TOBIN BRONZE
STATION NO. → 10 9 8 7 6 5 4 3 2 1 0
FRAME NO. → 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3
WATER TIGHT BULKHEAD – 1/2" W.P. PLYWOOD
℄ OF EXHAUST PIPE
DECK FRAMING PLAN
6" CLEAT
PLANKING – 13/16" PHIL. MAHOGANY IN NARROW STRAKES
FLOORS – W. OAK SIDED 7/8" (KEEL BOLT FLOORS SIDED 1 5/8")
SECTION AT STA. NO. 5 (LOOKING FORWARD)
5" CLEAT
EDGE OF CABIN FLOOR
HATCH
BREAST HOOK – W. OAK, 1 1/2" THICK
25 LB. YACHTSMAN'S GALV. KEDGE ANCHOR
BRONZE COMB. BITT & MOORING CHOCK
JIB STAY DECK PLATE & TACK FITTING – CAST BRONZE
NO. 1 SWIVEL DECK PLATE BLOCKS
DECK PLAN
COCKPIT FLOOR – 3/4"X4" MAHOGANY, IN SECTIONS, AS REQUIRED FOR SPACE UNDER
6" BRONZE TRU-FORM CLEATS
LKR LKR (UNDER COCKPIT SEAT)
12" 5 1/2"
℄ OF CHAIN PLATES
NO. 2 BRONZE FAIRLEADS
HAND RAIL – 3/8" THICK MAHOGANY

sail from spilling the wind at each roll of the ship, besides tending to improve the set of the sail at all other times. There is so much more to be said in favor of a heavy boom than there is in favor of the light boom that it seems doubly justified to use it on a small vessel like Ostkust.

Mentioning the boom brings up one other feature of this design. As will be noted on the construction plan, a canvas awning has been indicated to fit over the boom and attached each side to the outside of the cockpit coaming and aft edge of the cabin top, providing additional shelter in the cockpit while at anchor on a rainy night, and also sheltering those who might be sleeping in the cockpit. As shown, provision has been made for two stretcher-type berths in the cockpit, which will bring the total sleeping accommodation in a pinch to four people. Although four is too many people for regular sleeping, it might be highly desirable on occasional weekends, and when these berths were not required they could be conveniently stowed.

These specifications are in standard form as intended for use by the professional builder. Consequently some of the paragraphs in the general conditions apply primarily to the professional builder and should be amplified and form part of the contract between the builder and owner. However in portions of the specifications alternate arrangements and materials have been given in addition to other notes that would apply only to amateur builders. It is these points that must be settled between the owner and a professional builder before being made a part of the contract, either by crossing out the nonapplicable portions or rewriting only the parts that should be retained.

SPECIFICATIONS

General Conditions

It is the intent and purpose of these specifications, together with the accompanying plans, to produce a first class and complete keel cruising sloop of the following dimensions: Length overall about 24 ft. 1 in., length waterline about 19 ft. 2 in., beam, extreme, about 7 ft. 0 in., draft about 3 ft. 7 in.

It is the intent that the builder shall complete the boat ready for sea, to be delivered afloat at the builder's yard, complete in all respects, with all equipment on board, paint work cleaned, and the bilges cleaned of all chips, sawdust, shavings, dirt or any rubbish before the application of paint or which may obstruct the timbers on pumps.

The builder will provide suitable dry storage space and any labor necessary for storing any equipment purchased by the owner and intended for the vessel, and also provide the necessary materials and labor to bend, install or stow such equipment on board.

Items shown in the plans and not appearing in the specifications or vice versa shall be considered as appearing in both, and it is understood that the builder will supply and fit, without extra cost to the owner, any small fittings or fixtures not specifically mentioned herein, but required to make the vessel complete.

All workmanship must be first class, and to the entire satisfaction of the owner. The work must be carefully and thoroughly executed by skilled mechanics, and work open to inspection at all reasonable times.

All materials and manufactured articles used in the construction must be of the best grade and quality. All wood to be of select stock, free of sap, bad knots, shakes, checks or other defects. Planking must be of close grained, firm, rift sawed stock. All oak must be dense hard white oak. No red oak is to be used in any place. All wood must be properly seasoned. Defective material, equipment or workmanship will be removed whenever developed and replacd without cost to the owner.

Should the owner consider it necessary or desirable in the course of construction to make any changes in the arrangement or details, so long as the general character and arrangement of the vessel is maintained, such changes must be made by the builder without invalidating the contract, provided that no work has been done on the particular part to which the alteration refers. Charges or credits for such alterations will be agreed on in writing before the execution of the work. No charges for extra work will be allowed unless such charges have been authorized in writing by the owner before beginning the work. No extra work is to be considered as invalidating the contract and no delay in the completion of the contract due to such extra work is to be allowed, unless authorized in writing by the owner.

The vessel is to be covered by the standard builder's risk insurance by the builder during the construction, ashore, during launching, and afloat until delivered fully and specifically insured. The insurance is to be in an amount at least equal to the partial payments that shall have been made by the owner, the loss if any to be payable as the interests of the respective parties may appear.

The lines are to be laid down full size from the offsets and carefully faired.

After final inspection and satisfactory trial and all details of the plans and specifications have been completed as acknowledged by the owner, the builder shall deliver to the owner all documents showing clear title, license fees paid, etc., and formally deliver the vessel upon payment of the balance of money due.

The following plans by the architect are hereby made a part of the specifications: Lines and Offsets Dwg. No. S-610-1, Sail and Rigging Plan Dwg. No. S-620-1, Cabin—Construction Plan Dwg. No. S-635-1.

HULL SPECIFICATIONS

In general the sizes and arrangements are to be as shown on the Cabin-Construction Plan, Dwg. No. S-635-1.

In general all fastenings are to be bronze wood screws or bolts and are to be of approved sizes or as shown where required.

Wood Keel, Sternpost, Stem and Deadwood

The keel, sternpost, stem and deadwood fore and aft are to be of white oak, sided as required, to provide proper back rabbet for the planking and molded as shown on Lines and Offsets, Dwg. No. S-610-1. All faying surfaces are to be painted with thick white lead and oil paint immediately before bolting together. In addition all parts after being set up shall be given two coats of linseed oil to prevent undue drying out or checking. Soft pine stop-waters, $\frac{5}{8}$ in. dia., are to be carefully fitted at all necessary points as shown, which is the intersection of the back rabbet and seam. Entire assembly to be well smoothed and then well coated with Cuprinol or equal wood preservative.

Outside Ballast

The outside ballast is to be in the form of single lead casting weighing approximately 1,600 lbs., fastened as shown to the wood floors and keel with $\frac{9}{16}$-in. dia. Tobin bronze bolts. The finished outside lead casting is to be checked for weight and before bolting together a felt pad soaked in thick lead paint is to be placed between the lead and wood just before bolting up. Also about 200 pounds of lead ballast in 15 or 20 pound pigs is to be provided for trimming purposes.

Frames

The frames are to be white oak, sided and molded $\frac{7}{8}$-in. selecled stock, steam bent

and spaced 7 in. centers. The heels of the frames are to be boxed and fastened to the backbone. They shall also be fastened to the floor timbers with at least three $\frac{3}{16}$-in. dia. bz. bolts. Where severe bends occur as aft in the vicinity of the deadwood and it becomes impractical to use a solid frame, the frame may be split in a fore and aft direction from the bottom of the frame to just beyond the point of extreme bend. In such cases the plank fastenings are to extend through the outer member well into the inner member, drawing the two tightly together.

Floors

The floors are to be white oak, molded as shown or to have a minimum length of 7 in. measured along the center of the frame, whichever is the larger. In no case shall the floor have less than 1¾ in. depth over the backbone nor shall the top of the floor be other than straight except in the ends. All ordinary floors are to be sided ⅞ in. Keel bolt floors are to be sided 1⅝ in. Floors under the engine bed and at Fr. 14 and 26 are to be sided 1⅜ in. The floor at Fr. 26 is also to be rabbeted to take the lower edge of the watertight bulkhead. All floors except on frame 26 are to have sufficient clear limber holes.

Transom

The transom planking is to be single thickness $\frac{13}{16}$-in. thick Philippine mahogany or equal. Cheek pieces and framing to be sawed to shape of white oak, ⅞ in. thick by 2 in. wide. Quarter knees located aft as shown to attach the transom to the clamp to be 1½-in. thick white oak, thoroughly bolted with ¼-in. dia. bz. bolts. The transom planking fastened to the framing and cheek pieces with No. 9 flathead Everdur wood screws, 1¼ in. long. All fastenings from outside to be countersunk and bunged with wood plugs of same material as the transom planking.

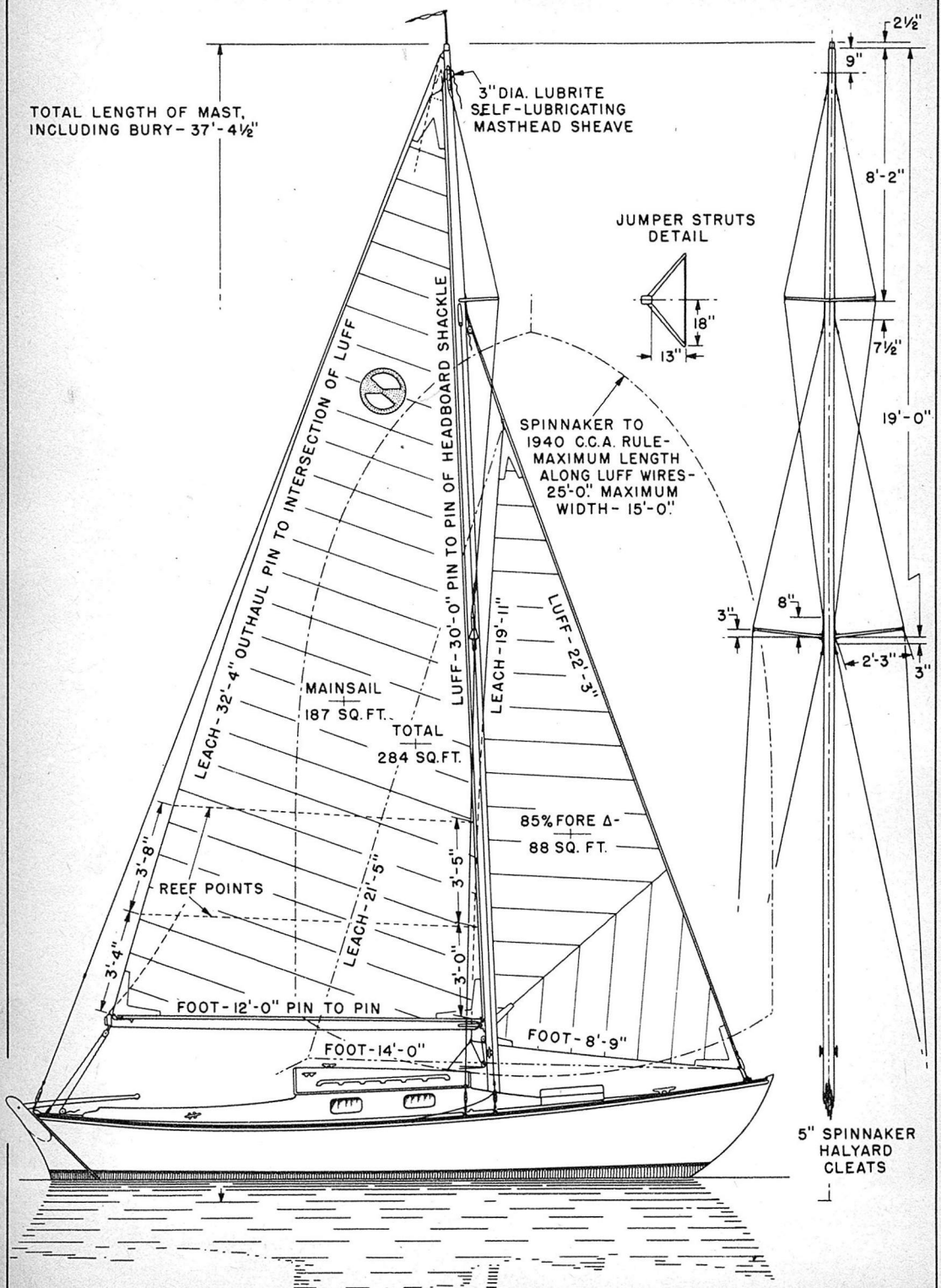
Clamp

The clamp is to be 1⅜x3-in. Oregon pine or yellow pine for ¾ length amidships straight tapering to 1x2¼ in. at the ends and through bolted to alternate frame heads and the sheer strake and to intermediate frame heads only with $\frac{3}{16}$-in. dia. carriage bolts.

Bilge Stringer

While no bilge stringer is shown, being considered unnecessary for a boat of this size, it might be highly desirable for a boat that might be aground often as in some of

GENERAL SAIL PLAN



our small shallow harbors. In that case if one is fitted, the bilge stringer should be 7/8x2¾-in. Oregon pine or yellow pine for ¾ length amidships, straight tapered to 1x2¼ in. at the ends and through bolted to the frames with 3/16-in. dia. carriage bolts.

Planking

The planking is to be Philippine mahogany or cedar to finish 13/16 in. Sheer strake may be finished to 15/16". All planking to be in narrow strakes fastened to the frames and backbone with No. 9 flathead wood screws 1¼ in. long. All fastenings are to be spaced a maximum of 1½ in. or a minimum of two fastenings per plank and slightly staggered. The heads of all fastenings to be countersunk and bunged with wood plugs having the grain run in the same direction as the grain of the planking. Butts of the planking are to be well shifted so that no two butts shall come in the same frame space except there be three clear strakes between and in no adjacent plank be nearer than three frame spaces.

Deck Beams

The deck beams are to be located as shown. The ordinary beams are to be spruce molded 1½ in. and sided ¾ in. and located where not noted otherwise. The heavy beams are to be white oak molded 1½ in. and sided 1½ in., located where noted on the deck framing plan. All the deck beams are to have 3½ in. camber in 7 ft. 0 in., modified if necessary to produce a fair deck line at center. No fastenings are required or desired between the frame heads and beams.

Carlins

The carlins are to be white oak sided 1⅛ in. and molded 2 in. The carlin is to be dovetailed into the heavy deck beams and extend from the heavy deck beam on aft side frame 16 to the heavy deck beam on forward side frame 37. The half beams in this length are to be dovetailed into the carlin.

Header

The headers in the way of the forward hatch between frames 9 and 12 are to be of white oak molded 1½ in. and sided 1½ in. The ordinary beams are to be dovetailed into the header and the header is to be dovetailed into the heavy beams.

Blocking and Breasthooks

The blocking is to be located and of sizes as shown. All deck fittings are to have blocking fitted between the deck beams

where required and of sizes similar to that shown.

Mainmast Step

The mast step is to be white oak molded 3 in. and sided 5½ in., mortised to take the mast tenon. In addition the mast step is to be fitted with drain holes.

Chainplates

The chainplates are to be arranged as shown of $\frac{5}{16}$x1¼-in. Everdur flat bar or equal. A backing piece or chock cut to bear against the clamp is to be fitted in the way of each chainplate and the chainplate and backing piece are to be through bolted to the planking with ¼-in. dia. F.H. bolts of same material as chainplates.

Rudder

The rudder blade is to be of mahogany, white oak or teak thoroughly drift bolted. At the forward edge the rudder is to be 1⅞ in. thick tapering to ⅜ in. thick on the after edge from station 10 to the knuckle at the L.W.L., gradually increasing to the full thickness at the cheek pieces and the heel of the rudder.

The cheek pieces are to be of the same material as the rudder, ⅞ in. thick fitted to each side of the rudder blade, and arranged to take the tiller which shall be of white oak or locust arranged in the general fashion as shown to permit the tiller to be tilted up to 30 in.

There shall be three sets of rudder pintles and gudgeons of cast manganese bronze located about as shown, scored into the rudder or sternpost and through riveted.

Decking

The decking is to be ⅝-in. T. and G. cedar or preferably ½-in. waterproof fir plywood, smoothed down and covered with a single piece of No. 10 canvas laid in thick lead paint. The edge of the canvas is to be turned up in the way of the forward hatch and also up in the way of the cabin trunk and covered with a ⅜x3-in. dia. mahogany molding facer piece. The outboard edge is to be turned down and covered with a 1-in dia. half round mahogany rub strake.

In addition a ⅝x⅝-in. mahogany toe rail is to be fitted along the deck edge and gradually widen out as indicated at the transom and stem.

Cabin Trunk and Coaming

The cabin trunk sides, forward end and cockpit coaming are to be ⅞-in. mahogany with the sides and coaming from the for-

ward hatch frame 12 to frame 37 at the after end preferably in a single piece, bolted to the carlins with $\frac{3}{16}$-in. dia. bz. bolts. The corner posts fitted at each corner of the trunk are to be 1½x1½-in. white oak thoroughly through bolted with $\frac{3}{16}$-in. dia. bolts to the sides, ends, bulkheads, carlins and deck beams. The coaming forward of the cabin trunk and extending to the forward hatch is to be through bolted to the deck beams with $\frac{3}{16}$-in. dia. bolts.

The cabin top beams are to be white oak, laminated, sided ⅝ in. and molded 1⅛ in., equally spaced for length of the cabin trunk as indicated. The ends of the beams are to be supported by a ½x2-in. cedar clamp. The cabin top is to be ⅜-in. waterproof D. fir plywood or ½x3-in. T. and G. cedar, screw fastened to the deck beams and edges, smoothed down and covered with one piece of No. 10 canvas laid in thick lead paint. The edge of the canvas is to be turned down and covered with a 1-in. dia. half round mahogany molding.

Main Bulkhead

The main bulkhead on the forward side of frame 26 is to be ½-in. thick waterproof plywood, mahogany faced, rabbeted into floor timber and is to be made thoroughly watertight to at least 3 in. above the designed L.W.L. A canvas gasket soaked in thick lead paint is to be placed between the bulkhead and frame and planking before bolting together.

JOINER WORK

Deck Joiner Work

The deck joiner work is to be generally arranged as shown or as previously mentioned. The forward hatch, coaming, etc., to be of mahogany thoroughly fastened together with rabbeted sill to insure ample watertightness.

The hand rail is to be ⅝ in. thick mahogany through fastened to the deck beams as indicated.

Cockpit

The cockpit is to be arranged generally as shown on the plans. The cockpit floor beams and framing to be white oak sided ⅞ in. and molded 1½ in., arranged to suit the engine box and for accessibility to the engine.

The cockpit floor is to be reasonably watertight but arranged in sections to be

lifted up for accessibility to the space below. The floor is to be ¾x4-in. mahogany or teak, screw fastened.

The cockpit seats, locker fronts and sides are to be of material, sizes, and arranged as indicated, screw fastened with round head wood screws for maximum ease of accessibility.

DECK HARDWARE

In general of manganese bronze, arranged as shown. The top edge of the cockpit coaming is to be protected with ¾-in. dia. bz. half round in the way of the mainsheet at frame 37.

All deck fittings are to be set in thick lead paint before bolting down.

All deck hardware when referred to by fig. no. unless noted otherwise refers to the catalogue of Merriman Brothers, 185 Amory Street, Boston, Massachusetts.

INTERIOR JOINER WORK

The interior joiner work in general as shown is to be of ⅜-in. thick waterproof plywood with the framing where required of pine or cedar.

The cabin floor and forward platform top is to be of ½-in. thick material or as indicated otherwise, and arranged in removable sections for easy access to the space below.

At all times care is to be taken that the weight of the joiner work is kept to an absolute minimum regardless of whether the arrangement as shown is used or not.

PLUMBING

Toilet

The toilet is to be a Wilcox, Crittenden Junior Sea Clo or equal. The discharge line is to be looped well above the load waterline and to be directed to the port side forward seacock.

Seacocks

The seacocks are to be fitted on all through hull connections.

The intake seacocks are to be Willis R-4275 or equal through bolted to oak blocks on inside of planking.

The discharge seacocks are to be Willis R-4278 through bolted to oak blocks on the inside of the planking, having a lead sleeve through opening in oak block and planking, finishing flush with planking and turned over on the inside of the block.

ENGINE INSTALLATION

Engine Beds

The engine bed spaced to suit the engine

base is to be white oak sided 2″, of approximate size as shown.

Engine

The engine is to be a Lauson LF-827 2½ hp. water cooled model or equal manufacture, equipped with reverse gear and high tension flywheel type magneto ignition, rope starting.

The engine installation is to meet the full requirements of the National Fire Protection Association or government regulations as may be applicable. In general all openings through the hull to 12 in. above the L.W.L. shall be fitted with seacocks.

Exhaust Piping

The exhaust piping is to be ¾-in. dia. I.P.S. standard pipe, located approximately where shown, care being taken that no pockets are in the line.

Propeller and Shaft

The propeller is to be a two-blade 8-in. dia. by 4-in. pitch, bored and keyed to standard taper to fit the ¾-in. dia. Tobin bronze propeller shaft or equal material. The stuffing box and stern bearing are to be cast bronze of Hyde manufacture light pattern or equal to suit the propeller shaft.

Engine Controls

The engine controls to be generally as shown with the switch located in the forward starboard cockpit locker under the seat, the throttle under the engine box or arranged to suit. The reverse lever where projecting through the floor is to be arranged to be removable when not in use.

Gasoline Tank

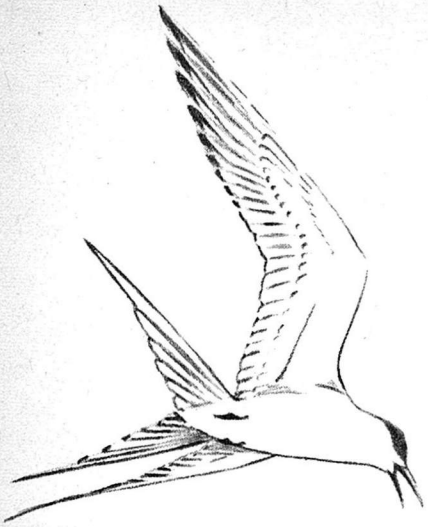
The gasoline tank is to be of copper, tin lined or galvanized steel, located where shown and of about 5 gallon capacity.

The fill cap is to project through the seat top and is to vent overboard. A shutoff cock is to be fitted at the tank for the supply line of size to suit the engine.

SPARS AND RIGGING

Spars

The spars are to be of best grade dry Sitka spruce of sizes built up as shown. Casein or urea resin glue is to be used in attaching parts together. All scarphs to be carefully fitted and to have a minimum ratio of 12 to 1 length to thickness.



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Mainmast is to be built-up hollow spar of oval section reinforced where required as indicated. Inside of mast wired for radio antennae.

Main boom and spinnaker pole are to be a solid spar.

Sail track and slides on upper side of main boom and aft side of mainmast are to be fitted with Merriman Brothers Fig. 406 ⅝ in. wide. All joints are to be brazed before fastening the sail track. All screws attaching the track to the mast shall be the maximum length without penetrating the mast shell and the screws for the boom track shall be this same length.

The spreaders are to be one piece Sitka spruce complete with necessary required fittings and of lengths as shown.

Rigging and Turnbuckles

The rigging and turnbuckles are to be as shown on Dwg. No. S-620-1.

Block List

The block list is to be as shown on Dwg. No. S-620-1.

Rigging Fittings

The rigging fittings are to be of Merriman Brothers manufacture or equal.

PAINTING

All the exposed surfaces shall be made acceptably smooth by planing and sanding down to an even texture. Dents and holes are to be filled with putty after priming coat has been applied. The seams in the hull shall be caulked with cotton and filled with putty colored to match the final paint. The putty shall be worked well down to the caulking material and the seams filled nearly flush with the surface of the planking. All surfaces shall be sandpapered between coats and after previous coat has thoroughly dried.

Varnished work shall be filled with stain to give the required color.

Painted work shall be primed with the finish paint thinned with one pint of boiled linseed oil to a gallon of paint.

All faying surfaces are to be carefully painted during assembly. End grain is to be especially well painted. Antifouling paint is to be used for planking below the waterline and on all parts outside paint to match the finish color shall be used for this purpose.

Underbody

The underbody is to be painted in accordance with the manufacturer's recommendations regarding new work, with a minimum of three coats of bottom paint with color and make to suit.

The lead keel is to have one coat of brushing cement applied to the bare lead, sandpapered, and trowel cement applied and sandpapered before applying paint.

Boot Top

The boot top stripe of color and make to suit is to be as shown on Dwg. No. S-610-1 and S-620-2 and is to be applied in accordance with the manufacturer's recommendations regarding new work.

Topsides

The topsides are to be painted with one coat of thinned primer after seams are caulked and before putty or seam compound is applied. Two coats of flat followed by two coats of semigloss of color and make as selected are to be applied. (In this respect white is recommended as the best hull protection in hot weather.)

Decks

When canvas has been laid, sponge with fresh water and while wet apply one coat of hull primer such as Smith's hull primer. Apply two coats of deck paint or enamel of color and make as per owner's selection.

Interior

One thinned coat and one normal coat of paint as directed by owner below cabin or cockpit floor and back of joiner work.

Remainder of interior to be finished as directed.

Brightwork

Rails, cockpit coaming and cabin sides, forward hatch, boom crotch, and where directed shall be given a minimum of four coats of best spar varnish as selected by the owner applied in accordance with the manufacturer's recommendation regarding new work.

Spars

The spars are to be varnished or painted as directed by the owner, of material as selected by the owner, and applied in accordance with the manufacturer's recommendation regarding new work.

NAME, HAILING PORT AND NUMBERS

The name and hailing port to be gilded on the transom with gold leaf in the best yacht practice. The name is to be 3-in. high letters and the hailing port in 2-in. high letters. The registered numbers are to be 3 in. high on each side of the bow as re-

quired. All the letters are to be outlined in color matching the boot top.

EQUIPMENT

Owner's Equipment

The owner shall furnish all the equipment not specifically mentioned, including the sails and bags, flags, bedding, galley equipment, stove, portable icebox, charts, compass, etc.

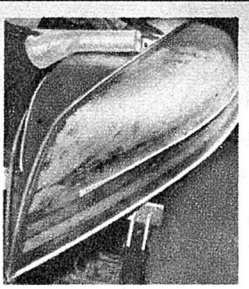
Builder's Equipment List

The builder will supply and install the following equipment:

1. Two Sea Hair, Air-Foam, or equal cushions 4 in. thick.
2. Eight wardrobe hooks, located to suit, in the clothes locker and forepeak.
3. Shelves to suit.
4. Oil running lights, galv. iron, as required by law.
5. Oil anchor light, galv. iron, as required by law.
6. Four kapok jacket type life preservers as approved by the U. S. Steamboat Inspection.
7. One boat hook, brass, with 6-ft. ash pole with clips to stow under deck.
8. Clips for stowage of spinnaker pole above or below deck.
9. Two fenders, 3x12-in. Rubatex or equal.
10. Mast coats of heavy canvas, painted. No tacks are to be used in attaching to the mast.
11. Galv. iron bilge pump, 2-in. dia., with length to suit and fitted with two feet of rubber hose on the discharge end.
12. One twelve-quart fiber bucket.
13. One mop.
14. One chamois at least 12x12 in.
15. Two ½-in. dia. manila deck lines, five fathoms each, with eye splice on one end only.
16. Boom crotch, mahogany, single leg type, for main boom with necessary sockets.
17. Twenty-five lb. yachtsman's type galvanized kedge anchor with ten feet of $\frac{3}{16}$-in. chain, shackled to anchor ring.
18. Twenty fathoms of 1-in. manila anchor line, one end fitted with eye splice, thimble and shackle to suit anchor chain. •

Clean hull with sander

Mix Castoglas and Hardener



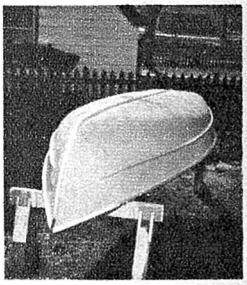
Apply resin and fabric

Trim fabric with scissors

Repeat process on other side

Work resin in with hands

Shape cloth around sprayrail



This hull won't leak again

How You Can Make Your Old Boat New With Fiberglass

Bill Weers Speaking:

"If you have an old wooden boat or are planning to build a new one, listen to this, please. Getting a boat ready can be a lot of fun when the whole family cheerfully pitches in. But, as time goes on, this joyful occasion all too often degenerates into a doggone tiresome one-man chore. And when you spend more time on sanding, scraping, calking and fixing than in boating or fishing, the fun goes out of it. What is the answer? Fiberglass! Half a million wooden boats, old and new, have been fiberglassed within the short space of ten years. It must be good, it *is* good, and better now than ever.

No More Calking—No More Painting

"Once on, fiberglass stays on and makes any boat permanently leakproof, rotproof, waterlogproof, wormproof, mildewproof, weatherproof. Its tough, resilient bottom protects the hull against rocks, snags, stumps, hidden logs and ledges. The boat is not only made watertight, but the Castoglas-fiberglass plating won't rust, corrode or crack. Gasoline, oil, salt water, burning hot sun, ice and sleet won't bother this boat. Tough? You bet it is!

How You Can Make a Fiberglass Boat Out of Your Old Wooden Hull

"Talking about all-fiberglass boats . . . they are fine and we sell a lot of materials from which they are made. But many boat owners don't realize that they can convert their old boat into a fiberglass boat. Actually, it becomes a combination wood-and-glass boat with the advantages of both. The action photos shown above explain the simple A-B-C's of fiberglassing an old wooden hull. You can do it, anybody can, by just following the easy step-by-step illustrated directions.

You Can "Glass" Any Boat You Are Going to Build

"Maybe you're planning to build a brand new boat from a plan or kit you have just bought—or expect to buy. O.K. Now you can take that plan or kit . . . yes, ANY plan or kit . . . and fiberglass that boat after you have built it. For all practical purposes, you now have most of the advantages of an all-fiberglass boat and, honestly, it's amazing how little it costs. For a really first class job, with the best materials money can buy, these prices give you an idea of the cost. Covering the bottom of an average 8-foot boat runs to $18.50; 10-foot, $21.50; 12-foot, $28.50; 14-foot, $39.50 and 16-foot, $47.50. That added cost is an investment which pays for itself over and over again. Many a seemingly hopeless hull became a better boat after it was fiberglassed than it ever was when brand new. I mean that, literally.

And Talk About Saving Money and Making Money

"Castolite liquid resins have an endless number of uses in and around the home and shop. 'How to Patch With Fiberglass and Castoglas' is one of a series of CASTOLITERS we want you to have if you are interested in saving money. This year, we are also publishing a completely revised issue of 'How to Earn Extra Money in Your Spare Time.' Over 300,000 copies of this booklet have been sold to date. I guess you'd call it a 'best seller.' The new edition contains illustrated case histories about the money-making possibilities in the boat field. You don't want to miss that . . . it's loaded with opportunities.

"I am going to ask you to share the printing cost of these valuable manuals with us. Please fill out the coupon below and return it with 25c to

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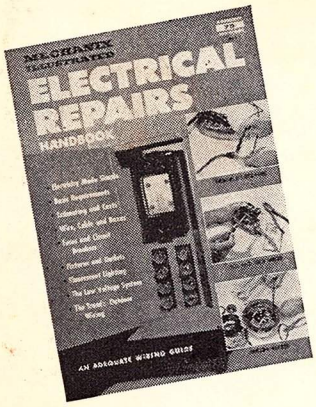

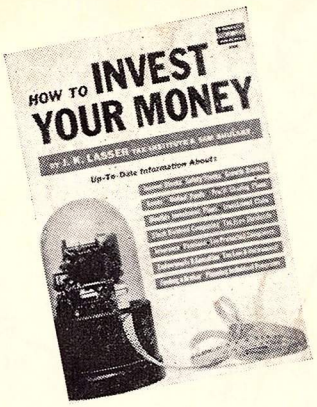

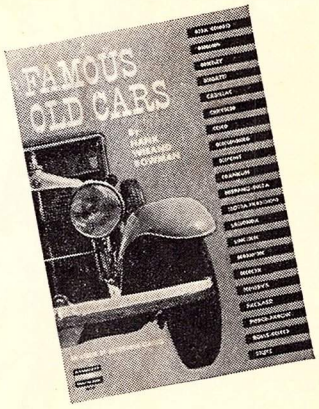

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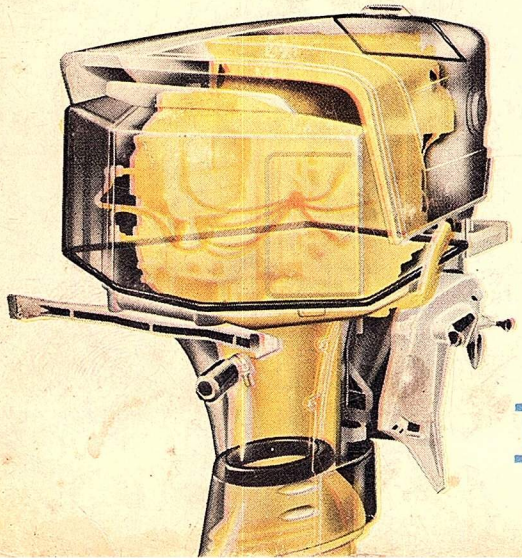

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